

	A	B	C	D	E	F	G	H	I	J
1	<b>Appendix A: Emissions Calculations</b>									
2	<b>Summary of Emissions</b>									
3										
4	<b>Company Name: MGPI of Indiana, LLC</b>									
5	<b>Address: 7 Ridge Avenue, Lawrenceburg, Indiana 47025</b>									
6	<b>Significant Source Modification No.: 0296-35496-00005</b>									
7	<b>Significant Permit Modification No.: 029-35505-00005</b>									
8	<b>Reviewer: Kristen Willoughby</b>									
9	<b>Date: 12/22/14</b>									
10										
11	<b>Potential to Emit Before Controls (ton/yr)</b>									
12	<i>Significant Emission Units</i>	<b>PM</b>	<b>PM10</b>	<b>PM2.5</b>	<b>SO2</b>	<b>NOx</b>	<b>VOC</b>	<b>CO</b>	<b>GHG</b>	<b>Total HAPs</b>
13		(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)
14	One (1) pneumatic conveyor, identified as EU-11	189.22	189.22	16.08	-	-	-	-	-	-
15	One (1) corn receiving and storage system, identified as EU-12 (Stack S-111)	225.26	225.26	19.15	-	-	-	-	-	-
16	One (1) grain transport system, identified as EU-12 (Stack S-112)	20.33	20.33	1.73	-	-	-	-	-	-
17	Seven (7) storage bins, collectively identified as EU-13	20.33	20.33	1.73	-	-	-	-	-	-
18	Six (6) hammermills, collectively identified as EU-14	90.10	90.10	7.66	-	-	-	-	-	-
19	EU-21, which consists of fourteen (14) open fermenters	-	-	-	-	-	7.81	-	-	0.04
20	DDGS Storage (EU-34)	29.76	29.76	2.53	-	-	-	-	-	-
21	DDGS Rail/Truck Loadout (EU-35/EU-36)	27.18	27.18	2.31	-	-	-	-	-	-
22	DDGS Rail/Truck Loader(EU-37/EU-38)	0.27	0.27	0.05	-	-	-	-	-	-
23	Twenty-four (24) closed fermenters, collectively identified as EU-22	-	-	-	-	-	57.79	-	-	0.26
24	Two (2) beer wells, identified as EU-23 and EU-24	-	-	-	-	-	12.51	-	-	-
25	Distillation (EU-20 and EU-25 through EU-29)	-	-	-	-	-	0.09	-	-	3.43E-03
26	Four (4) paddle screens, identified as EU-31 and three (3) conveyors, identified as EU-33	-	-	-	-	-	440.00	-	-	2.00
27	Five (5) rotary dryers, collectively identified as EU-32	201.04	201.04	201.04	-	-	893.43	-	-	69.90
28	One (1) cooler, and one (1) transport system, collectively identified as EU-32	18.80	13.38	7.94	-	-	9.16	-	-	1.28
29	One (1) DDG Dryer, identified as EU-39	418.77	418.77	418.77	18.84	27.86	418.77	464.28	27,473	39.36
30	Wet Pad, identified as EU-40	-	-	-	-	-	See Note	-	-	See Note
31	One (1) wine room, identified as EU-41	-	-	-	-	-	19.52	-	-	-
32	One (1) tank farm, identified as EU-42	-	-	-	-	-	19.01	-	-	-
33	EU-43, which consists of Building 88	-	-	-	-	-	4.69	-	-	-
34	One (1) mini-tank farm, identified as EU-45	-	-	-	-	-	3.59	-	-	-
35	One (1) barrel and emptying operation, identified as EU-61	-	-	-	-	-	12.01	-	-	-
36	Six (6) warehouses, identified as EU-71 through EU-76	-	-	-	-	-	1867.41	-	-	-
37	One (1) steam boiler, identified as EU-96	1.99	7.96	7.96	0.63	293.37	5.76	88.01	126,479	1.98
38	One (1) steam boiler, identified as EU-97 (worst case fuel)	2.85	3.28	2.21	60.77	28.53	1.12	17.17	31,926	0.39
39	One (1) loading rack, identified as EU-46	-	-	-	-	-	6.69	-	-	0.05
40	<b>Subtotal Significant Emission Unit</b>	<b>1245.92</b>	<b>1246.90</b>	<b>689.16</b>	<b>80.25</b>	<b>349.76</b>	<b>3779</b>	<b>569.46</b>	<b>185878</b>	<b>115.2</b>
41	<b>Fugitive Emissions</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>128.2</b>	<b>-</b>	<b>-</b>	<b>0.90</b>
42	Emergency Generator-Diesel	0.28	0.16	0.16	1.62	9.60	0.28	2.20	462	4.41E-03
43	Emergency Generator-Natural gas	1.16E-03	1.46E-03	1.46E-03	1.78E-05	0.10	3.63E-03	0.01	4.29	2.38E-03
44	FW Pump-Diesel	0.13	0.13	0.13	0.12	1.82	0.15	0.39	67.79	1.59E-03
45	<b>Subtotal Insignificant Activities</b>	<b>0.41</b>	<b>0.29</b>	<b>0.29</b>	<b>1.74</b>	<b>11.5</b>	<b>0.43</b>	<b>2.60</b>	<b>533.65</b>	<b>8.38E-03</b>
46	<b>Total</b>	<b>1246.33</b>	<b>1247.19</b>	<b>689.45</b>	<b>81.99</b>	<b>361.28</b>	<b>3908</b>	<b>572.07</b>	<b>186412</b>	<b>116.15</b>
47	<i>Note: This plant is capable to produce both DDGS and MDGS. The emissions from the DDGS production is the worst case scenario. Therefore, the PTE</i>									
48	<i>of the wet cake storage is not included in the PTE for the entire source.</i>									

	A	B	C	D	E	F	G	H	I	J	
49	<b>Appendix A: Emissions Calculations</b>										
50	<b>Summary of Emissions</b>										
51											
52	Company Name: MGPI of Indiana, LLC										
53	Address: 7 Ridge Avenue, Lawrenceburg, Indiana 47025										
54	Significant Source Modification No.: 0296-35496-00005										
55	Significant Permit Modification No.: 029-35505-00005										
56	Reviewer: Kristen Willoughby										
57	Date: 12/22/2014										
58											
59	<b>Potential to Emit After Control (ton/yr)</b>										
60	<b>Significant Emission Units</b>	<b>PM</b>	<b>PM10</b>	<b>PM2.5</b>	<b>SO2</b>	<b>NOx</b>	<b>VOC</b>	<b>CO</b>	<b>GHG</b>	<b>Total HAPs</b>	
61		(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	
62	One (1) pneumatic conveyor, identified as EU-11	1.89	1.89	0.32	-	-	-	-	-	-	
63	One (1) corn receiving and storage system, identified as EU-12 (Stack S-111)	2.25	2.25	0.38	-	-	-	-	-	-	
64	One (1) grain transport system, identified as EU-12 (Stack S-112)	0.20	0.20	0.03	-	-	-	-	-	-	
65	Seven (7) storage bins, collectively identified as EU-13	0.20	0.20	0.03	-	-	-	-	-	-	
66	Six (6) hammermills, collectively identified as EU-14	0.90	0.90	0.15	-	-	-	-	-	-	
67	EU-21, which consists of fourteen (14) open fermenters	-	-	-	-	-	7.81	-	-	0.04	
68	DDGS Storage (EU-34)	0.30	0.30	0.05	-	-	-	-	-	-	
69	DDGS Rail/Truck Loadout (EU-35/EU-36)	0.27	0.27	0.05	-	-	-	-	-	-	
70	DDGS Rail/Truck Loader(EU-37/EU-38)	0.27	0.27	0.05	-	-	-	-	-	-	
71	Twenty-four (24) closed fermenters, collectively identified as EU-22	-	-	-	-	-	57.79	-	-	0.26	
72	Two (2) beer wells, identified as EU-23 and EU-24	-	-	-	-	-	12.51	-	-	-	
73	Distillation (EU-20 and EU-25 through EU-29)	-	-	-	-	-	0.09	-	-	3.43E-03	
74	Four (4) paddle screens, identified as EU-31 and three (3) conveyors, identified as EU-33	-	-	-	-	-	440.00	-	-	2.00	
75	Five (5) rotary dryers, collectively identified as EU-32	30.16	30.16	30.16	-	-	893.43	-	-	69.90	
76	One (1) cooler, and one (1) transport system, collectively identified as EU-32	4.99	3.22	1.40	-	-	9.16	-	-	1.28	
77	One (1) DDG Dryer, identified as EU-39	8.38	8.38	8.38	18.84	27.86	8.38	46.43	27,473	1.18	
78	Wet Pad, identified as EU-40	-	-	-	-	-	See Note	-	-	-	
79	One (1) wine room, identified as EU-41	-	-	-	-	-	19.52	-	-	-	
80	One (1) tank farm, identified as EU-42	-	-	-	-	-	19.01	-	-	-	
81	EU-43, which consists of Building 88	-	-	-	-	-	4.69	-	-	-	
82	One (1) mini-tank farm, identified as EU-45	-	-	-	-	-	3.59	-	-	-	
83	One (1) barrel and emptying operation, identified as EU-61	-	-	-	-	-	12.01	-	-	-	
84	Six (6) warehouses, identified as EU-71 through EU-76	-	-	-	-	-	1867	-	-	-	
85	One (1) steam boiler, identified as EU-96	1.99	7.96	7.96	0.63	293.37	5.76	88.01	126,479	1.98	
86	One (1) steam boiler, identified as EU-97 (worst case fuel)	2.85	3.28	2.21	60.77	28.53	1.12	17.17	31,926	0.39	
87	One (1) loading rack, identified as EU-46	-	-	-	-	-	6.69	-	-	0.05	
88	<b>Subtotal Significant Emission Unit</b>	<b>54.66</b>	<b>59.29</b>	<b>51.17</b>	<b>80.25</b>	<b>349.76</b>	<b>3,369</b>	<b>151.61</b>	<b>185,878</b>	<b>77.07</b>	
89	<b>Fugitive Emissions</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>0.0</b>	<b>-</b>	<b>-</b>	<b>0.00</b>	
90	Emergency Generator-Diesel	0.28	0.16	0.16	1.62	9.60	0.28	2.20	462	4.41E-03	
91	Emergency Generator-Natural gas	1.16E-03	1.46E-03	1.46E-03	1.78E-05	0.10	3.63E-03	0.01	4.29	2.38E-03	
92	FW Pump-Diesel	0.13	0.13	0.13	0.12	1.82	0.15	0.39	67.8	1.59E-03	
93	<b>Subtotal Insignificant Activities</b>	<b>0.41</b>	<b>0.29</b>	<b>0.29</b>	<b>1.74</b>	<b>11.52</b>	<b>0.43</b>	<b>2.60</b>	<b>534</b>	<b>8.38E-03</b>	
94	<b>Total</b>	<b>55.07</b>	<b>59.58</b>	<b>51.46</b>	<b>81.99</b>	<b>361.28</b>	<b>3,369</b>	<b>154.21</b>	<b>186,412</b>	<b>77.08</b>	
95	<i>Note: This plant is capable to produce both DDGS and MDGS. The emissions from the DDGS production is the worst case scenario. Therefore, the PTE</i>										
96	<i>of the wet cake storage is not included in the PTE for the entire source.</i>										

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98	<b>Summary of Emissions</b>									
99										
100	Company Name: MGPI of Indiana, LLC									
101	Address: 7 Ridge Avenue, Lawrenceburg, Indiana 47025									
102	Significant Source Modification No.: 0296-35496-00005									
103	Significant Permit Modification No.: 029-35505-00005									
104	Reviewer: Kristen Willoughby									
105	Date: 12/22/2014									
106										
107	<b>Potential to Emit After Issuance of Permit (Limited PTE) (ton/yr)</b>									
108	<b>Significant Emission Units</b>	<b>PM</b>	<b>PM10</b>	<b>PM2.5</b>	<b>SO2</b>	<b>NOx</b>	<b>VOC</b>	<b>CO</b>	<b>GHG</b>	<b>Total HAPs</b>
109		(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)	(tons/yr)
110	One (1) pneumatic conveyor, identified as EU-11	189.22	189.22	16.08	-	-	-	-	-	-
111	One (1) corn receiving and storage system, identified as EU-12 (Stack S-111)	5.26	5.26	19.15	-	-	-	-	-	-
112	One (1) grain transport system, identified as EU-12 (Stack S-112)	0.96	0.96	1.73	-	-	-	-	-	-
113	Seven (7) storage bins, collectively identified as EU-13	0.20	0.20	0.03	-	-	-	-	-	-
114	Six (6) hammermills, collectively identified as EU-14	90.1	90.1	7.66	-	-	-	-	-	-
115	EU-21, which consists of fourteen (14) open fermenters	-	-	-	-	-	7.81	-	-	0.04
116	DDGS Storage (EU-34)	0.60	0.60	2.53	-	-	-	-	-	-
117	DDGS Rail/Truck Loadout (EU-35/EU-36)	1.27	1.27	2.31	-	-	-	-	-	-
118	DDGS Rail/Truck Loader(EU-37/EU-38)	5.48	5.48	0.05	-	-	-	-	-	-
119	Twenty-four (24) closed fermenters, collectively identified as EU-22	-	-	-	-	-	57.79	-	-	0.26
120	Two (2) beer wells, identified as EU-23 and EU-24	-	-	-	-	-	12.51	-	-	-
121	Distillation (EU-20 and EU-25 through EU-29)	-	-	-	-	-	0.09	-	-	0.00
122	Four (4) paddle screens, identified as EU-31 and three (3) conveyors, identified as EU-33	-	-	-	-	-	440.00	-	-	2.00
123	Five (5) rotary dryers, collectively identified as EU-32	19.85	19.85	19.85	-	-	893.43	-	-	69.90
124	One (1) cooler, and one (1) transport system, collectively identified as EU-32	7.16	4.43	1.60	-	-	9.16	-	-	1.28
125	One (1) DDG Dryer, identified as EU-39	8.4	8.4	8.4	18.84	27.86	8.37	46.43	27,473	20.30
126	Wet Pad, identified as EU-40	-	-	-	-	-	See Note	-	-	-
127	One (1) wine room, identified as EU-41	-	-	-	-	-	19.52	-	-	-
128	One (1) tank farm, identified as EU-42	-	-	-	-	-	19.01	-	-	-
129	EU-43, which consists of Building 88	-	-	-	-	-	4.69	-	-	-
130	One (1) mini-tank farm, identified as EU-45	-	-	-	-	-	3.59	-	-	-
131	One (1) barrel and emptying operation, identified as EU-61	-	-	-	-	-	12.01	-	-	-
132	Six (6) warehouses, identified as EU-71 through EU-76	-	-	-	-	-	1,867	-	-	-
133	One (1) steam boiler, identified as EU-96	1.99	7.96	7.96	0.63	293.4	5.76	88.0	126,479	1.98
134	One (1) steam boiler, identified as EU-97 (worst case fuel)	1.98	2.65	1.96	39.77	25.38	0.56	10.42	24,674	0.39
135	One (1) loading rack, identified as EU-46	-	-	-	-	-	6.69	-	-	0.05
136	<b>Subtotal Significant Emission Unit</b>	<b>332.43</b>	<b>336.33</b>	<b>89.28</b>	<b>59.25</b>	<b>346.61</b>	<b>3,368</b>	<b>144.86</b>	<b>178,626</b>	<b>96.19</b>
137	<b>Fugitive Emissions</b>	-	-	-	-	-	<b>128.23</b>	-	-	<b>0.90</b>
138	Emergency Generator-Diesel	0.28	0.16	0.16	1.62	9.60	0.28	2.20	462	4.41E-03
139	Emergency Generator-Natural gas	1.16E-03	1.46E-03	1.46E-03	1.78E-05	0.10	3.63E-03	0.01	4.29	2.38E-03
140	FW Pump-Diesel	0.13	0.13	0.13	0.12	1.82	0.15	0.39	67.8	1.59E-03
141	<b>Subtotal Insignificant Activities</b>	<b>0.41</b>	<b>0.29</b>	<b>0.29</b>	<b>1.74</b>	<b>11.5</b>	<b>0.43</b>	<b>2.60</b>	<b>534</b>	<b>8.38E-03</b>
142	<b>Total</b>	<b>332.84</b>	<b>336.63</b>	<b>89.57</b>	<b>60.99</b>	<b>358.13</b>	<b>3,497</b>	<b>147.46</b>	<b>179,159</b>	<b>97.10</b>
143	Note: This plant is capable to produce both DDGS and MDGS. The emissions from the DDGS production is the worst case scenario. Therefore, the PTE									
144	of the wet cake storage is not included in the PTE for the entire source.									

	A	B	C	D	E	F	G
1	<b>Summary of HAP Emissions</b>						
2	<b>Company Name:</b>						
3	<b>Address:</b>						
4	<b>Significant Source Modification No.:</b>						
5	<b>Significant Permit Modification No.:</b>						
6	<b>Reviewer:</b>						
7	<b>Date:</b>						
8							
9							
10							
11	<b>Significant Emission Units</b>	<b>Benzene</b>	<b>Dichlorobenzene</b>	<b>Formaldehyde</b>	<b>Hexane</b>	<b>Toluene</b>	<b>Lead</b>
12		<b>ton/yr</b>	<b>ton/yr</b>	<b>ton/yr</b>	<b>ton/yr</b>	<b>ton/yr</b>	<b>ton/yr</b>
13							
14	One (1) pneumatic conveyor, identified as EU-11	-	-	-	-	-	-
15	One (1) corn receiving and storage system, identified as EU-12	-	-	-	-	-	-
16	Seven (7) storage bins, collectively identified as EU-13	-	-	-	-	-	-
17	Six (6) hammermills, collectively identified as EU-14	-	-	-	-	-	-
18	EU-21, which consists of fourteen (14) open fermenters	-	-	1.04E-03	-	-	-
19	Silos, surge hopper, and transport system: EU-34 through EU-36	-	-	-	-	-	-
20	Twenty-four (24) closed fermenters, collectively identified as EU-22	-	-	7.69E-03	-	-	-
21	Two (2) beer wells, identified as EU-23 and EU-24	-	-	-	-	-	-
22	Distillation (EU-20 and EU-25 through EU-29)	-	-	2.04E-04	-	-	-
23	Four (4) paddle screens, identified as EU-31 and three (3) conveyors, identified as EU-33	-	-	5.84E-02	-	-	-
24	Five (5) rotary dryers, collectively identified as EU-32	-	-	0.32	-	-	-
25	One (1) cooler, and one (1) transport system, collectively identified as EU-32	-	-	0.43	-	-	-
26	One (1) DDG Dryer, identified as EU-39	4.78E-04	2.73E-04	12.98	0.41	7.74E-04	1.14E-04
27	Wet Pad, identified as EU-40						
28	One (1) rail car loader and one (1) truck loader, identified as EU-37 and EU-38	-	-	-	-	-	-
29	One (1) wine room, identified as EU-41	-	-	-	-	-	-
30	One (1) tank farm, identified as EU-42	-	-	-	-	-	-
31	EU-43, which consists of Building 88	-	-	-	-	-	-
32	One (1) mini-tank farm, identified as EU-45	-	-	-	-	-	-
33	One (1) barrel and emptying operation, identified as EU-61	-	-	-	-	-	-
34	Six (6) warehouses, identified as EU-71 through EU-76	-	-	-	-	-	-
35	One (1) steam boiler, identified as EU-96	2.20E-03	1.26E-03	0.08	1.89	3.56E-03	5.24E-04
36	One (1) steam boiler, identified as EU-97 (worst case fuel)	4.29E-04	2.45E-04	0.02	0.37	6.95E-04	1.80E-03
37	One (1) loading rack, identified as EU-46	-	-	6.69E-03	-	-	-
38	Fugitive Emissions	-	-	0.13	-	-	-
39	<b>Subtotal Significant Emission Unit</b>	<b>3.11E-03</b>	<b>1.78E-03</b>	<b>14.02</b>	<b>2.66</b>	<b>5.03E-03</b>	<b>2.44E-03</b>
40	Emergency Generator-Diesel	2.17E-03	-	2.21E-04	-	7.87E-04	-
41	Emergency Generator-Natural gas	5.87E-05	-	1.67E-03	1.35E-05	-	-
42	FW Pump-Diesel	3.84E-04	-	4.85E-04	-	1.68E-04	-
43	<b>Subtotal Insignificant Activities</b>	<b>2.62E-03</b>	<b>0.00E+00</b>	<b>2.38E-03</b>	<b>1.35E-05</b>	<b>9.55E-04</b>	<b>0.00E+00</b>
44	<b>Total</b>	<b>5.72E-03</b>	<b>1.78E-03</b>	<b>14.03</b>	<b>2.66</b>	<b>5.99E-03</b>	<b>2.44E-03</b>
45	<i>Note: This plant is capable to produce both DDGS and MDGS. The emissions from the DDGS production is the worst case scenario. Therefore, the PTE</i>						
46	<i>of the wet cake storage is not included in the PTE for the entire source.</i>						

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1	<b>Appendix A: Emissions Calculations</b>											
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5	7 Ridge Avenue, Lawrenceburg, Indiana 47025											
6	0296-35496-00005											
7	029-35505-00005											
8	Kristen Willoughby											
9	12/22/2014											
10												
11	Cadmium	Chromium	Manganese	Nickel	Acetaldehyde	Propionaldehyde	Methanol	Acrolein	PAH	1,3-Butadiene	Xylene	Total HAP
12	ton/yr	ton/yr	ton/yr	ton/yr	ton/yr	ton/yr	ton/yr	ton/yr	ton/yr	ton/yr	ton/yr	ton/yr
13												
14	-	-	-	-	-	-	-	-	-	-	-	0.00
15	-	-	-	-	-	-	-	-	-	-	-	0.00
16	-	-	-	-	-	-	-	-	-	-	-	0.00
17	-	-	-	-	-	-	-	-	-	-	-	0.00
18	-	-	-	-	0.03	2.09E-03	1.04E-03	-	-	-	-	0.04
19	-	-	-	-	-	-	-	-	-	-	-	0.00
20	-	-	-	-	0.23	1.54E-02	7.69E-03	-	-	-	-	0.26
21	-	-	-	-	-	-	-	-	-	-	-	0.00
22	-	-	-	-	2.81E-03	2.04E-04	2.04E-04	-	-	-	-	3.43E-03
23	-	-	-	-	1.77	0.12	0.06	-	-	-	-	2.00
24	-	-	-	-	55.24	-	11.05	3.28	-	-	-	69.90
25	-	-	-	-	0.69	-	0.15	0.01	-	-	-	1.28
26	2.50E-04	3.19E-04	8.65E-05	4.78E-04	20.94	-	4.61	0.42	-	-	-	39.36
27	See Note											
28	-	-	-	-	-	-	-	-	-	-	-	0.00
29	-	-	-	-	-	-	-	-	-	-	-	0.00
30	-	-	-	-	-	-	-	-	-	-	-	0.00
31	-	-	-	-	-	-	-	-	-	-	-	0.00
32	-	-	-	-	-	-	-	-	-	-	-	0.00
33	-	-	-	-	-	-	-	-	-	-	-	0.00
34	-	-	-	-	-	-	-	-	-	-	-	0.00
35	1.15E-03	1.47E-03	3.98E-04	2.20E-03	-	-	-	-	-	-	-	1.98
36	5.99E-04	5.99E-04	1.20E-03	5.99E-04	-	-	-	-	-	-	-	0.39
37	-	-	-	-	6.69E-03	-	3.34E-02	-	-	-	-	0.05
38	-	-	-	-	1.28E-01	-	6.41E-01	-	-	-	-	0.90
39	<b>2.00E-03</b>	<b>2.38E-03</b>	<b>1.68E-03</b>	<b>3.28E-03</b>	<b>79.0</b>	<b>0.14</b>	<b>16.55</b>	<b>3.71</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>116.15</b>
40	-	-	-	-	7.06E-05	-	-	2.21E-05	5.94E-04	-	5.40E-04	4.41E-03
41	-	-	-	-	2.35E-04	-	7.50E-05	2.35E-04	4.05E-06	2.48E-05	-	2.32E-03
42	-	-	-	-	3.15E-04	-	-	3.80E-05	6.91E-05	-	1.17E-04	1.58E-03
43	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>0.00E+00</b>	<b>6.21E-04</b>	<b>0.00E+00</b>	<b>7.50E-05</b>	<b>2.95E-04</b>	<b>6.67E-04</b>	<b>2.48E-05</b>	<b>6.58E-04</b>	<b>0.008</b>
44	<b>2.00E-03</b>	<b>2.38E-03</b>	<b>1.68E-03</b>	<b>3.28E-03</b>	<b>79.0</b>	<b>0.14</b>	<b>16.55</b>	<b>3.71</b>	<b>6.67E-04</b>	<b>2.48E-05</b>	<b>6.58E-04</b>	<b>116.155</b>
45												
46												

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9								
10								
11	Stack ID	Process Description	Control Device	Outlet Grain Loading (gr/dscf)	Maximum Air Flow Rate (scfm)	PTE of PM/PM10 after Control* (lb/hr)	PTE of PM/PM10 after Control (ton/yr)	PTE of PM2.5 after Control** (lb/hr)
12	S-103	Grain Receiving and pneumatic conveyor EU-11	Baghouse	0.004	12,600	0.43	1.89	0.07
13	S-111	Corn Receiving and storage system EU-12	Baghouse	0.004	15,000	0.51	2.25	0.09
14	S-112	Grain Transport system EU-12	Baghouse	0.004	1,354	0.05	0.20	0.01
15	inside	Storage: (7) Grain Storage Silos (EU-13)	Baghouse	0.004	1,354	0.05	0.20	0.01
16	S-104	(6) Hammermills and hopper (EU-14)	Baghouse	0.004	6,000	0.21	0.90	0.03
17		<b>DDGS Storage (EU-34)</b>						
18	S-341	Storage silo	Baghouse	0.004	905	0.03	0.14	0.01
19	S-342	Storage silo	Baghouse	0.004	905	0.03	0.14	0.01
20	S-343	Surge Hopper	Baghouse	0.004	86	0.00	0.01	0.00
21	S-344	Surge Hopper	Baghouse	0.004	86	0.00	0.01	0.00
22	S-350	DDGS Rail Loadout (EU-35)	Baghouse	0.004	905	0.03	0.14	0.01
23	S-360	DDGS Truck Loadout (EU-36)	Baghouse	0.004	905	0.03	0.14	0.01
24	S-370	DDGS Rail Car Loader (EU-37)	None	0.004	905	0.03	0.14	0.01
25	S-380	DDGS Truck Loader (EU-38)	None	0.004	905	0.03	0.14	0.01
26	<b>Total</b>					<b>1.4</b>	<b>6.3</b>	<b>0.2</b>
27	*Assume all PM emissions equal PM10 emissions.							
28	** Assume controlled PM2.5 emissions equal 17% PM/PM10 emissions (AP-42 Table 9.9.1-1 Reference 40).							
29								
30	<b>Methodology:</b>							
31	outlet grain loading (gr/dscf) provided by source with maximum air flow rate (scfm)							
32	PTE of PM/PM10 after Control (lb/hr) = Outlet Grain Loading (gr/dscf) x Max. Air Flow Rate (scfm) x (60 min/hr) x (1 lb/7000 gr)							
33	PTE of PM/PM10 after Control (ton/yr) = Outlet Grain Loading (gr/dscf) x Max. Air Flow Rate (scfm) x (60 min/hr) x (1 lb/7000 gr) x (8760 hr/yr) x (1 ton/2000 lb)							
34	PTE before Control (ton/yr) = PTE after Control (ton/yr) / (1-Control Efficiency)							
35	PM2.5 Control Efficiency is assumed to be less than the PM/PM10 Control Efficiency.							

	I	J	K	L	M	N	O	P	Q	R
1	<b>Appendix A: Emissions Calculations</b>									
2	<b>Grain Handling</b>									
3										
4	Company Name: MGPI of Indiana, LLC									
5	Address: 7 Ridge Avenue, Lawrenceburg, Indiana 47025									
6	Significant Source Modification No.: 0296-35496-00005									
7	Significant Permit Modification No.: 029-35505-00005									
8	Reviewer: Kristen Willoughby									
9	Date: 12/22/2014									
10										
11	PTE of PM2.5 after Control (ton/yr)	PM/PM10 Control Efficiency	PM2.5 Control Efficiency	PTE of PM/PM10 before Control (ton/yr)	PTE of PM2.5 before Control (ton/yr)	Limited PTE PM (lb/hr)	Limited PTE PM10 (lb/hr)	Limited PTE PM2.5 (lb/hr)	Limited PTE PM (ton/yr)	Limited PTE PM10 (ton/yr)
12	0.32	99%	98%	189.2	16.1					
13	0.38	99%	98%	225.3	19.1	1.20	1.20	1.20	5.26	5.26
14	0.03	99%	98%	20.3	1.73	0.219	0.219	0.219	0.96	0.96
15	0.03	99%	98%	20.3	1.73					
16	0.15	99%	98%	90.1	7.66					
17										
18	0.02	99%	98%	13.6	1.16	0.136	0.136	0.136	0.60	0.60
19	0.02	99%	98%	13.6	1.16					
20	0.00	99%	98%	1.3	0.11					
21	0.00	99%	98%	1.3	0.11					
22	0.02	99%	98%	13.6	1.16	0.289	0.289	0.289	1.27	1.27
23	0.02	99%	98%	13.6	1.16					
24	0.02	0%	0%	0.14	0.02	1.25	1.25	1.25	5.48	5.48
25	0.02	0%	0%	0.14	0.02					
26	<b>1.1</b>	<b>10.9</b>	<b>10.8</b>	<b>602.5</b>	<b>51.2</b>	<b>3.1</b>	<b>3.1</b>	<b>3.1</b>	<b>13.6</b>	<b>13.6</b>
27										
28										
29										
30										
31										
32										
33										
34										
35										

	A	B	C	D	E
1	<b>Appendix A: Emissions Calculations</b>				
2	<b>VOC Emissions from Distillation and Beer Wells</b>				
3					
4	Company Name: MGPI of Indiana, LLC				
5	Address: 7 Ridge Avenue, Lawrenceburg, Indiana 47025				
6	Significant Source Modification No.: 0296-35496-00005				
7	Significant Permit Modification No.: 029-35505-00005				
8	Reviewer: Kristen Willoughby				
9	Date: 12/22/2014				
10	EU-20, 25-29 Distillation	<b>Potential to Emit (PTE) of VOC:</b>			
11					
12					
13		<b>Maximum Usage (gal/hr)</b>	<b>VOC Emission Factor (lb/1000 gal)</b>	<b>VOC Emission rate (lb/hr)</b>	<b>VOC Emission rate (ton/yr)</b>
14		31,221	0.000679	0.02	0.1
15					
16	Methodology:				
17		Emission factor is based on facility information and furnished by source.			
18		Emission Rate (lb/hr) = Usage (gal/hr)/1,000 x EF (lb/1,000 gal)			
19		Emission Rate (ton/yr) = Emission Rate (lb/hr) x 8,760 hr/yr / 2,000 lb/ton			
20					
21	EU-20, EU25- EU-29 Distillation Operations	<b>VOC (lb/hr) = 0.02</b>			
22					
23					
24					
25		Distillation			
26		<b>Uncontrolled PTE</b>	<b>lb HAPs/lb VOC</b>	<b>ton/yr</b>	
27		Acetaldehyde	3.03E-02	2.81E-03	
28		Propionaldehyde	2.20E-03	2.04E-04	
29		Methanol	2.20E-03	2.04E-04	
30		Formaldehyde	2.20E-03	2.04E-04	
31		<b>Total Uncontrolled HAP</b>		<b>3.43E-03</b>	
32					
33	Methodology:				
34		lb HAPs/lb VOC emission factors are from uncontrolled distillation in Permit No. T133-31145-00003			
35		HAP (ton/yr) = E.F. (lb HAPs/lb VOC) x VOC (lb/hr) x 8760 (hrs/yr) x 1/2000 (ton/lb)			
36					
37					
38	EU-23 and EU-24 Beer Wells #3 and #1	Maximum Usage 1,050 1,000 bu/hr			
39					
40					
41		<b>Pollutant</b>	<b>Emission Factor (lb/1,000 bu)</b>	<b>VOC Emission rate (lb/yr)</b>	<b>VOC Emission rate (ton/yr)</b>
42		VOC	2.72	2.86	12.5
43					
44	Methodology:				
45		Emission factor is based on facility information and furnished by source.			
46		Emission rate (lb/hr) = Maximum usage (1,000 bu/hr) x EF (lb / 1,000 bu)			
47		Emission Rate (lb/hr) = Emission Rate (ton/yr) x 2,000 lb/ton / 8,760 hr/yr			
48					
49					

	A	B	C	D	E
50		<b>Appendix A: Emissions Calculations</b>			
51		<b>VOC Emissions from Open and Closed Fermentation</b>			
52					
53					Company Name: MGPI of Indiana, LLC
54					Address: 7 Ridge Avenue, Lawrenceburg, Indiana 47025
55					Significant Source Modification No.: 0296-35496-00005
56					Significant Permit Modification No.: 029-35505-00005
57					Reviewer: Kristen Willoughby
58					Date: 12/22/2014
59	<b>EU-21 Open Fermentation</b>				
60		<b>Potential to Emit (PTE) of VOC from Open Fermentation:</b>			
61					
62		Maximum Usage			1,095,000 bu/yr
63					
64					
65					
66					
67					
68					
69					
70					
71	<b>Methodology:</b>				
72		Emission Factors taken from AP-42, Table 9.12.3-1			
73		Emission Rate (ton/yr) = Usage (bu/yr)/1,000 x Emission Factor (lb/1,000 bu) / 2,000 lb/ton			
74		Emission Rate (lb/hr) = Emission Rate (ton/yr) x 2,000 lb/ton / 8,760 hr/yr			
75					
76					
77		<b>Potential to Emit (PTE) of HAP from Open Fermentation:</b>			
78			<b>VOC (lb/hr) = 1.78</b>		
79					
80					
81					
82					
83					
84					
85					
86					
87					
88					
89	<b>Methodology:</b>				
90		lb HAPs/lb VOC emission factors are from uncontrolled distillation in Permit No. T133-31145-00003			
91		HAP (ton/yr) = E.F. (lb HAPs/lb VOC) x VOC (lb/hr) x 8760 (hrs/yr) x 1/2000 (ton/lb)			
92					
93	<b>EU-22 Closed Fermentation</b>				
94		<b>Potential to Emit (PTE) of VOC Closed Fermentation:</b>			
95		Maximum Usage			8,103,000 bu/yr
96					
97					
98					
99					
100					
101					
102					
103					
104	<b>Methodology:</b>				
105		Emission Factors taken from AP-42, Table 9.12.3-1			
106		Emission Rate (ton/yr) = Usage (bu/yr)/1,000 x Emission Factor (lb/1,000 bu) / 2,000 lb/ton			
107		Emission Rate (lb/hr) = Emission Rate (ton/yr) x 2,000 lb/ton / 8,760 hr/yr			

Pollutant	Emission Factor (lb/1,000 bu)	VOC Emission rate (lb/yr)	VOC Emission rate (ton/yr)
Ethanol	14.2	15,549	7.77
Ethyl Acetate	0.046	50	0.03
Isoamyl Alcohol	0.013	14	0.007
Isobutyl Alcohol	0.004	4	0.002
<b>Total VOC</b>	<b>14.3</b>		<b>7.81</b>

Uncontrolled PTE	Open Fermentation	
	lb HAPs/lb VOC	ton/yr
Acetaldehyde	4.02E-03	3.14E-02
Propionaldehyde	2.67E-04	2.09E-03
Methanol	1.33E-04	1.04E-03
Formaldehyde	1.33E-04	1.04E-03
<b>Total Uncontrolled HAP</b>		<b>0.04</b>

Pollutant	Emission Factor (lb/1,000 bu)	VOC Emission rate (lb/yr)	VOC Emission rate (ton/yr)
Ethanol	14.2	115,063	57.53
Ethyl Acetate	0.046	373	0.19
Isoamyl Alcohol	0.013	105	0.05
Isobutyl Alcohol	0.004	32	0.02
<b>Uncontrolled VOC</b>	<b>14.263</b>		<b>57.8</b>

	A	B	C	D	E
108					
109		<b>Potential to Emit (PTE) of HAP from Closed Fermentation:</b>			
110					
111			VOC (lb/hr)	=	13.19
112					
113				Closed Fermentation	
114		<b>Uncontrolled PTE</b>	<b>lb HAPs/lb VOC</b>		<b>ton/yr</b>
115		Acetaldehyde	4.02E-03		2.32E-01
116		Propionaldehyde	2.67E-04		1.54E-02
117		Methanol	1.33E-04		7.69E-03
118		Formaldehyde	1.33E-04		7.69E-03
119		<b>Total Uncontrolled HAP</b>			<b>0.26</b>
120					
121	Methodology:	lb HAPs/lb VOC emission factors are from uncontrolled distillation in Permit No. T133-31145-00003			
122		HAP (ton/yr) = E.F. (lb HAPs/lb VOC) x VOC (lb/hr) x 8760 (hrs/yr) x 1/2000 (ton/lb)			
123					

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64	<b>VOC Emission rate (lb/hr)</b>
65	1.78
66	0.006
67	0.002
68	0.0005
69	1.78
70	
71	
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96	
97	<b>VOC Emission rate (lb/hr)</b>
98	13.14
99	0.04
100	0.01
101	0.004
102	<b>13.2</b>
103	
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	A	B	C						
1			<b>Appendix A: Em</b>  <b>Company Name:</b> <b>Address:</b> <b>Significant Source Modification No.:</b> <b>Significant Permit Modification No.:</b> <b>Reviewer:</b> <b>Date:</b>						
2									
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11	<b>EU-31 and EU-33 Paddle Screens/ Conveyors</b>								
12			<table border="1"> <thead> <tr> <th data-bbox="755 575 2400 665">Source</th> <th data-bbox="2400 575 2615 665">Max Usage (gal/hr)</th> </tr> </thead> <tbody> <tr> <td data-bbox="755 665 2400 698">Spirits System</td> <td data-bbox="2400 665 2615 698">20,859</td> </tr> <tr> <td data-bbox="755 698 2400 732">Whisky System</td> <td data-bbox="2400 698 2615 732">4,319</td> </tr> </tbody> </table>	Source	Max Usage (gal/hr)	Spirits System	20,859	Whisky System	4,319
Source	Max Usage (gal/hr)								
Spirits System	20,859								
Whisky System	4,319								
13									
14									
15									
16									
17	<b>Methodology:</b>								
18		Emission Rate = Maximum Usage (gal/hr)/1,000 x VOC Emission factor (lb/1,000 gal)							
19		* Spirits System analysis of stillage based on 0.05% alcohol concentration.							
20		*Whisky System analysis of stillage based on 0.1% alcohol concentration.							
21									
22			VOC (lb/hr) =						
23									
24									
25									
26									
27									
28									
29									
30									
31	<b>Methodology:</b>								
32		Ib HAPs/lb VOC emission factors are from uncontrolled distillation in Permit No. T133-31145-00003 and derived from the mash scrubber emissions							
33		HAP (ton/yr) = E.F. (lb HAPs/lb VOC) x VOC (lb/hr) x 8760 (hrs/yr) x 1/2000 (ton/lb)							

	D	E	F
1	<b>Emissions Calculations</b>		
2	<b>Summary of Emissions</b>		
3			
4	<b>MGPI of Indiana, LLC</b>		
5	<b>7 Ridge Avenue, Lawrenceburg, Indiana 47025</b>		
6	<b>0296-35496-00005</b>		
7	<b>029-35505-00005</b>		
8	<b>Kristen Willoughby</b>		
9	<b>12/22/2014</b>		
10			
11			
12	<b>VOC Emission Factor* (lb/1,000 gal)</b>	<b>VOC Emission rate (lb/hr)</b>	<b>VOC Emission rate (ton/yr)</b>
13	3.4	70.92	311
14	6.8	29.37	129
15	<b>Total:</b>	<b>100</b>	<b>440</b>
16			
17			
18			
19			
20			
21			
22	<b>100.29</b>		
23			
24	<b>Stillage</b>		
25	<b>ton/yr</b>		
26	1.77		
27	1.17E-01		
28	5.84E-02		
29	5.84E-02		
30	<b>2.00</b>		
31			
32			
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10	<b>EU-32 Rotary Dryers</b>		
11			Maximum Usage:
12			
13			Controlled Emission Factor (lb/ton)
14		PM	0.27
15		PM10	0.27
16		PM2.5	0.27
17			
18	<b>Methodology:</b>	Controlled emission Factor from AP-42, Table 9.9.7-1	
19		Controlled Emissions (ton/yr) = Usage (ton/yr) x EF (lb/ton) x 8,760 hr/yr / 2,000 lb/ton	
20		Uncontrolled emissions estimated based on an 85% control efficiency for controlled emissions.	
21		PM2.5 emissions conservatively assumed to be equal to PM10 emissions.	
22			
23			
24		<b>VOC Emissions from the Dryers</b>	
25		Dryer Feed Rate (ton/hr)	Water Content (% by wt)
26		25.5	66.66%
27			
28	<b>Methodology</b>	Potential VOC Emissions from Dryers (lb/hr) = Dryer Feed Rate (25.5 ton/hr) x Water Content of Feed (% by wt) x (lb VOC/lb water) x (2000 lb/1 ton)	
29		Potential VOC Emissions from Dryers (ton/yr) = Potential VOC Emissions from Dryers (lb/hr) x (8760 hr/yr) x (1 ton/2000 lb)	
30			
31			
32		<b>HAP Emissions from the Dryers</b>	
33		HAP	HAP % (by wt of VOC)
34		Acetaldehyde	6.18%
35		Acrolein	0.37%
36		Methanol	1.24%
37		Formaldehyde	0.04%
38		<b>Total</b>	
39		Note: HAP emission rates based on performance tests at similar facilities.	
40	<b>Methodology</b>	Potential HAP Emissions from Dryers (lb/hr) = Potential VOC emissions from dryer (lb/hr) x HAP % by wt of VOC	
41		Potential HAP Emissions from Dryers (ton/yr) = Potential HAP Emissions from Dryers (lb/hr) x (8760 hr/yr) x (1 ton/2000 lb)	
42			

	D	E	F	G	H
1	<b>Appendix A: Emissions Calculations</b>				
2	<b>Five (5) rotary dryers</b>				
3					
4	Company Name: MGPI of Indiana, LLC				
5	Address: 7 Ridge Avenue, Lawrenceburg, Indiana 47025				
6	Significant Source Modification No.: 0296-35496-00005				
7	Significant Permit Modification No.: 029-35505-00005				
8	Reviewer: Kristen Willoughby				
9	Date: 12/22/2014				
10					
11	25.5 ton/hr		Limited Usage: 147,000 ton/yr		
12					
13	Controlled Emissions (lb/hr)	Controlled Emissions (ton/yr)	Uncontrolled Emissions (lb/hr)	Uncontrolled Emissions (ton/yr)	Limited Emissions (ton/yr)
14	6.885	30.2	45.90	201.0	19.85
15	6.885	30.2	45.90	201.0	19.85
16	6.885	30.2	45.90	201.0	19.85
17					
18					
19					
20					
21					
22					
23					
24					
25	VOC Content of Water (lb VOC/lb water)	Potential VOC from Dryers (lb/hr)	Potential VOCs from Dryers (ton/yr)		
26	0.006	204.0	893.4		
27					
28					
29					
30					
31					
32					
33	Potential HAP from Dryers (lb/hr)	Potential HAP from Dryers (ton/yr)			
34	12.61	55.24			
35	0.75	3.28			
36	2.52	11.05			
37	0.07	0.32			
38		<b>69.9</b>			
39					
40					
41					
42					

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	<b>Appendix A: Emissions Calculations</b>																
2	<b>DDG Cooler and Transport System Emission Estimates</b>																
3																	
4	Company Name: MGPI of Indiana, LLC																
5	Address: 7 Ridge Avenue, Lawrenceburg, Indiana 47025																
6	Significant Source Modification No.: 0296-35496-00005																
7	Significant Permit Modification No.: 029-35505-00005																
8	Reviewer: Kristen Willoughby																
9	Date: 12/22/2014																
10																	
11	Emission Unit	Emission Point	Description	Uncontrolled PM Emission Factor	Uncontrolled PM <sub>10</sub> Emission Factor	Uncontrolled PM <sub>2.5</sub> Emission Factor	DDG throughput		Uncontrolled PM Emission Rate		Uncontrolled PM <sub>10</sub> Emission Rate		Uncontrolled PM <sub>2.5</sub> Emission Rate		Controlled PM Emission Rate		
12				(lb/ton)			(lb/ton)	(lb/ton)	(ton/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)
13	EU-32	4 Screw Conveyors, 2 Drag Conveyors, 3 Product Conveyors, 1 K-Valve	Grain Conveying	0.061	0.034	0.0058	9.56	83,754	0.58	2.55	0.33	1.42	0.06	0.24	0.09	0.38	
14		Drum Cooler	Grain Conveying	0.061	0.034	0.0058			0.58	2.55	0.33	1.42	0.06	0.24	0.58	2.55	
15								<b>Totals</b>	<b>1.17</b>	<b>5.11</b>	<b>0.65</b>	<b>2.85</b>	<b>0.11</b>	<b>0.49</b>	<b>0.67</b>	<b>2.94</b>	
16																	
17	Emission Unit	Emission Point	Description	Controlled PM Emission Factor	Controlled PM <sub>10</sub> Emission Factor	Controlled PM <sub>2.5</sub> Emission Factor	DDG throughput		Controlled PM Emission Rate		Controlled PM <sub>10</sub> Emission Rate		Controlled PM <sub>2.5</sub> Emission Rate		Uncontrolled PM Emission Rate		
18				(lb/ton)			(lb/ton)	(lb/ton)	(ton/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)
19	EU-32	Hammer Mill	Hammer Milling <sup>(b)</sup>	0.067	0.052	0.036	9.56	83,754	0.47	2.05	0.36	1.58	0.26	1.12	3.13	13.69	
20								<b>Totals</b>	<b>0.47</b>	<b>2.05</b>	<b>0.36</b>	<b>1.58</b>	<b>0.26</b>	<b>1.12</b>	<b>3.13</b>	<b>13.69</b>	
21																	
22	Emission Unit	Emission Point	Description	Limited PM Emission Rate		Limited PM <sub>10</sub> Emission Rate		Limited PM <sub>2.5</sub> Emission Rate									
23				(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)								
24	EU-32	4 Screw Conveyors, 2 Drag Conveyors, 3 Product Conveyors, 1 K-Valve	Grain Conveying	0.58	2.55	0.33	1.42	0.06	0.24								
25		Drum Cooler	Grain Conveying	0.58	2.55	0.33	1.42	0.06	0.24								
26	EU-32	Hammer Mill	Hammer Milling <sup>(b)</sup>	0.47	2.05	0.36	1.58	0.26	1.12								
27	<b>Totals</b>			<b>1.64</b>	<b>7.16</b>	<b>1.01</b>	<b>4.43</b>	<b>0.37</b>	<b>1.60</b>								
28				1.05	4.61	0.69	3.00	0.31	1.36								
29	<b>Methodology:</b>																
30	(a) Factors taken from AP-42, Fifth Edition, Volume 1, Section 9.9.1 (Grain Elevators and Processes).																
31	(b) As recommended by AP-42 Appendix B.2, Table B.2.2 for Category 7 - "Grain Processing" on Page 17, the particle size distribution for PM <sub>10</sub> is 61% of Total PM and for PM <sub>2.5</sub> is 23% of Total PM for uncontrolled emissions. Additionally,																
32		Uncontrolled	Collection	Controlled													
33	<b>PM Size Range</b>	wt%	Efficiency	Controlled Wt	wt%												
34	PM <sub>2.5</sub>	23%	80%	0.046	54%												
35	PM <sub>2.5</sub> to PM <sub>10</sub>	38%	95%	0.019	22%												
36	PM <sub>10</sub> and higher	39%	95%	0.0195	23%												
37		1		0.0845													
38			Overall control:	91.6%													
39	(c) Methodology:																
40	Uncontrolled PTE (lb/hr) = [Uncontrolled Emission Factor (lb/ton DDG) x Production Rate (ton/hr)]																
41	Uncontrolled PTE (ton/yr) = [Uncontrolled Emission Factor (lb/ton DDG) x Production Rate (ton/yr) / 2,000 lb/ton]																
42	Controlled PTE Hammermill (lb/hr) = [Controlled Emission Factor (lb/ton DDG) x Production Rate (ton/hr)]																
43	Controlled PTE Hammermill (ton/yr) = [Controlled Emission Factor (lb/ton DDG) x Production Rate (ton/yr) / 2,000 lb/ton]																
44	Uncontrolled PTE Hammermill (lb/hr) = Controlled PTE Hammermill (lb/hr) / (1 - 85%)																
44	Uncontrolled PTE Hammermill (ton/yr) = Controlled PTE Hammermill (ton/yr) / (1 - 85%)																

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q																		
45	MGPI of Indiana, LLC																																		
46	7 Ridge Avenue, Lawrenceburg, Indiana 47025																																		
47																																			
48																																			
49	<b>Cooler Emissions (Continued)</b>																																		
50	Emission Unit	Emission Point	Description	Uncontrolled Emission Factors <sup>(a)</sup>		0.219 lb/ton DDG		0.016 lbs/ton DDG		0.00033 lbs/ton DDG		0.010 lbs/ton DDG		0.0036 lbs/ton DDG																					
51				DDG throughput		VOC		Acetaldehyde		Acrolein		Formaldehyde		Methanol																					
52				(ton/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)	(lb/hr)																	
53	EU-32	Drum Cooler	Cooling Drum Apparatus	10	83,754	2.09	9.16	0.16	0.69	0.0031	0.014	0.10	0.43	0.034	0.15	0.292																			
54		Existing Screw Conveyor	Grain Conveying																																
55		New 3 Screw Conveyors, 2 Drag Conveyors, 3 Product Conveyors, 1 K-Valve	Grain Conveying																																
56		Existing Hammer Mill and Cyclone	Hammer Milling																																
57																																			
58	<b>Methodology:</b>																																		
59	(a) VOC emission factor for DDG cooling taken from a similar operation permitted in Indiana under Permit #T169-31191-00068 (POET Biorefining - North Manchester). HAP emission factors are derived as a percentage of the VOC emission factor presented, assuming																																		
60	(b) Methodology :																																		
61	Emission rate (lb/hr) = DDG Throughput (ton/hr) X DDG Cooling Emission factor (lb/ton)																																		
62	Emission rate (ton/yr) = DDG Throughput (ton/yr) X DDG Cooling Emission factor (lb/ton) x ton/2,000 lb																																		
63																																			
64	Dryer emissions																																		
65	<table border="1"> <thead> <tr> <th></th> <th>tpy from Drying</th> <th>% of VOC</th> </tr> </thead> <tbody> <tr> <td>VOC</td> <td>8.38</td> <td>--</td> </tr> <tr> <td>Acetaldehyde</td> <td>0.63</td> <td>7.50%</td> </tr> <tr> <td>Acrolein</td> <td>0.01</td> <td>0.15%</td> </tr> <tr> <td>Formaldehyde</td> <td>0.39</td> <td>4.65%</td> </tr> <tr> <td>Methanol</td> <td>0.14</td> <td>1.65%</td> </tr> </tbody> </table>																		tpy from Drying	% of VOC	VOC	8.38	--	Acetaldehyde	0.63	7.50%	Acrolein	0.01	0.15%	Formaldehyde	0.39	4.65%	Methanol	0.14	1.65%
	tpy from Drying	% of VOC																																	
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66																																			
67																																			
68																																			
69																																			
70																																			
71																																			
72	Other DDG Cooler Emission Factors																																		
73	POET Biorefining - N Manchester																																		
74	5.685 lb VOC/hr From June 2004 testing at POET-Biorefining Jewell (IA)																																		
75	26 ton DDG/hr																																		
76	0.218653846 lb VOC / ton DDG																																		

	R	S	T	U
1				
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10				
11	<b>Controlled PM<sub>10</sub> Emission Rate</b>		<b>Controlled PM<sub>2.5</sub> Emission Rate</b>	
12	<b>(lb/hr)</b>	<b>(ton/yr)</b>	<b>(lb/hr)</b>	<b>(ton/yr)</b>
13	0.05	0.21	0.01	0.04
14	0.33	1.42	0.06	0.24
15	<b>0.37</b>	<b>1.64</b>	<b>0.06</b>	<b>0.28</b>
16				
17	<b>Uncontrolled PM<sub>10</sub> Emission Rate</b>		<b>Uncontrolled PM<sub>2.5</sub> Emission Rate</b>	
18	<b>(lb/hr)</b>	<b>(ton/yr)</b>	<b>(lb/hr)</b>	<b>(ton/yr)</b>
19	2.41	10.53	1.70	7.46
20	<b>2.41</b>	<b>10.53</b>	<b>1.70</b>	<b>7.46</b>
21				
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	R	S	T	U						
45	<b>Significant Source Modification No.: 0296-35496-00005</b>									
46	<b>Significant Permit Modification No.: 029-35505-00005</b>									
47										
48										
49	<table border="1"> <tr> <td colspan="2"><b>Total HAP Emissions</b></td> </tr> <tr> <td colspan="2"><b>(ton/yr)</b></td> </tr> <tr> <td colspan="2" style="text-align: center;">1.28</td> </tr> </table>				<b>Total HAP Emissions</b>		<b>(ton/yr)</b>		1.28	
<b>Total HAP Emissions</b>										
<b>(ton/yr)</b>										
1.28										
50										
51										
52										
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54										
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56										
57	g that individual HAPs are emitted in the									
58										
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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	
1	<b>Appendix B: Emissions Calculations</b>																	
2	<b>DDG Dryer (EU-39)</b>																	
3																		
4	Company Name: MGPI of Indiana, LLC																	
5	Address: 7 Ridge Avenue, Lawrenceburg, Indiana 47025																	
6	Significant Source Modification No.: 0296-35496-00005																	
7	Significant Permit Modification No.: 029-35505-00005																	
8	Reviewer: Kristen Willoughby																	
9	Date: 12/22/2014																	
10																		
11	<b>Combustion Source</b>		<b>Hourly MMBtu/hr</b>	<b>Annual MMBtu/yr</b>	<b>Heat Content (Btu/scf)</b>	<b>Fuel Usage (MMcf/yr)</b>												
12	Direct-fired Dryer Heat Input Capacity <sup>(a)</sup>		45	394,200	1,020	386.47												
13	RTO Heat Input Capacity <sup>(a)</sup>		8	70,080	1,020	68.71												
14	Total Heat Input Capacity		53	464,280		455.18												
15																		
16	<b>Production Capacity</b>		<b>ton/hr</b>	<b>ton/yr</b>														
17	Short-term Disasters Dry Grain (DDG) Production <sup>(b)</sup>		9.6	83,754														
18																		
19	Control Efficiency For Criteria Emissions (% Removal) <sup>(c)</sup>		<b>Pollutant</b>	<b>Control Efficiency</b>														
20			HAPs	97%														
21			VOC	98%														
22			CO	90%														
23			PM/PM <sub>10</sub> /PM <sub>2.5</sub>	98%														
24																		
25	Emissions From DDG Drying (EU-39)	<b>Pollutant</b>	<b>NOx</b>		<b>CO</b>		<b>SO<sub>2</sub></b>		<b>VOC</b>		<b>PM</b>				<b>PM<sub>10</sub></b>		<b>PM<sub>2.5</sub></b>	
26		Uncontrolled Emission Factor	0.12		2.0		0.45		10.0		10.0				10.0		10.0	
27			lbs/MMBtu		lbs/MMBtu		lbs/ton DDG		lbs/ton DDG		lbs/ton DDG				lbs/ton DDG		lbs/ton DDG	
28		Units	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr		tpy		lbs/hr	tpy	lbs/hr	tpy
29	Uncontrolled PTE		6.36	27.86	106.00	464.28	4.30	18.84	95.61	418.77	95.61		418.77		95.61	418.77	95.61	418.77
30	Controlled PTE		-	-	10.60	46.43	-	-	1.91	8.38	1.91		8.38		1.91	8.38	1.91	8.38
31	Limited PTE		6.36	27.86	10.60	46.43	4.30	18.84	1.91	8.37	1.91		8.38		1.91	8.38	1.91	8.38
32																		
33	HAP Emissions From DDG Drying (EU-39)	Pollutant Uncontrolled Emission Factor <sup>(e)</sup>	<b>Acetaldehyde</b>		<b>Formaldehyde</b>		<b>Acrolein</b>		<b>Methanol</b>		<b>Total HAP (from Natural Gas Combustion)</b>				<b>Total HAP Emissions<sup>(e)</sup></b>			
34			0.5		0.31		0.01		0.11		See Below							
35			lbs/ton DDGS		lbs/ton DDGS		lbs/ton DDGS		lbs/ton DDGS									
36			Units	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr		tpy		lbs/hr	tpy	
37	Uncontrolled PTE		4.78	20.94	2.96	12.98	0.10	0.42	1.05	4.61	0.09		0.41		8.99	39.36		
38	Controlled PTE		0.14	0.63	0.09	0.39	0.00	0.01	0.03	0.14	2.82E-03		0.01		0.27	1.18		
39	Limited PTE		1.91	8.38	1.48	6.49	0.10	0.42	1.05	4.61	0.09		0.41		8.99	20.30		

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	
40	MGPI of Indiana, LLC												DDG Dryer (EU-39) Continued				Significant Source Modification No.: 0296-35496-00005	
41	7 Ridge Avenue, Lawrenceburg, Indiana 47025												Significant Permit Modification No.: 029-35505-00005					
42																		
43	Combustion HAPs - Organics																	
44			Benzene	Dichlorobenzene	Formaldehyde	Hexane	Toluene	Total - Organics										
45	Emission Factor in lb/MMcf		2.1E-03	1.2E-03	Included	1.8E+00	3.4E-03											
46					Above													
47																		
48	Potential Emission in tons/yr		4.779E-04	2.731E-04		4.097E-01	7.738E-04	4.112E-01										
49																		
50																		
51	Combustion HAPs - Metals																	
52			Lead	Cadmium	Chromium	Manganese	Nickel	Total - Metals										
53	Emission Factor in lb/MMcf		5.0E-04	1.1E-03	1.4E-03	3.8E-04	2.1E-03											
54																		
55																		
56	Potential Emission in tons/yr		1.138E-04	2.503E-04	3.186E-04	8.648E-05	4.779E-04	1.247E-03										
57																		
58																		
59	<b>Notes:</b> Design heat inputs of direct fired dryer and of thermal oxidizer provided by the manufacturer (ICM, Inc.).																	
60	(a) Maximum short-term distiller's dry grain (DDG) production rate taken from facility information. Capacity of proposed system will be equivalent to combined capacity of the existing steam-tube dryers (portion of existing EU-32). Material balance is as follows:																	
61	(b)																	
62				(lb/hr)	%solids													
63		Dryer feed	35,508	35.5%														
64		Water / Evaporation	21,508	0%														
65		DDG Production	14,000	90%														
66	Annual operations assume that the proposed dryer will operate at capacity continuously throughout the year.																	
67	Dryer uncontrolled emission factors and cyclone/thermal oxidizer control efficiencies provided by the manufacturer (ICM, Inc.). Assume PM/PM <sub>10</sub> emissions are equivalent. Under the Part 70 Permit Program particulate matter with an aerodynamic diameter less than or equal to a																	
68	(c) Dryer uncontrolled emission factors and thermal oxidizer control efficiencies provided by the manufacturer (ICM, Inc.). Emission factors for specific HAPs include both process emissions from the DDG drying operations and natural gas combustion emissions occurring																	
69	Methodology:																	
70	(d) Nox and CO:																	
71	Uncontrolled PTE (lb/hr) = [Uncontrolled Emission Factor (lb/MMBtu) x Design Firing Rate (MMBtu/hr)]																	
72	Uncontrolled PTE (ton/yr) = [Uncontrolled Emission Factor (lb/MMBtu) x Design Firing Rate (MMBtu/yr) / 2,000 lb/ton]																	
73	SO <sub>2</sub> :																	
74	Uncontrolled PTE (lb/hr) = [Uncontrolled Emission Factor (lb/ton DDG) x Production Rate (ton/hr)]																	
75	Uncontrolled PTE (ton/yr) = [Uncontrolled Emission Factor (lb/ton DDG) x Production Rate (ton/yr) / 2,000 lb/ton]																	
76	VOC, PM/PM <sub>10</sub> /PM <sub>2.5</sub> :																	
77	Controlled PTE (lb/hr) = [Controlled Emission Factor (lb/ton DDG) x Production Rate (ton/hr)]																	
78	Controlled PTE (ton/yr) = [Controlled Emission Factor (lb/ton DDG) x Production Rate (ton/yr) / 2,000 lb/ton]																	
79	Uncontrolled PTE (lb/hr) = [Uncontrolled PTE (lb/hr) x (1 - Control Efficiency)]																	
80	Uncontrolled PTE (tpy) = [Uncontrolled PTE (tpy) x (1 - Control Efficiency)]																	
81	HAPs (lb/ton emission factor):																	
82	Uncontrolled PTE (lb/hr) = [Uncontrolled Emission Factor (lb/ton DDG) x Production Rate (ton/hr)]																	
83	Uncontrolled PTE (ton/yr) = [Uncontrolled Emission Factor (lb/ton DDG) x Production Rate (ton/yr) / 2,000 lb/ton]																	
84	Controlled PTE (lb/hr) = [Uncontrolled Emission Rate (lb/hr) x (1 - Control Efficiency)]																	
85	Controlled PTE (ton/yr) = [Uncontrolled Emission Rate (ton/yr) x (1-Control Efficiency)]																	
86	HAPs (lb/MMcf emission factor):																	
87	Emission Factors are from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2, 1.4-3, SCC #1-02-006-02, 1-01-006-02, 1-03-006-02, and 1-03-006-03																	
88	Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton																	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q																																																												
88	MGPI of Indiana, LLC		DDG Dryer (EU-39) Continued										Significant Source Modification No.: 0296-35496-00005																																																																
89	7 Ridge Avenue, Lawrenceburg, Indiana 47025												Significant Permit Modification No.: 029-35505-00005																																																																
90																																																																													
91	<b>Greenhouse Gas Calculations</b>																																																																												
92																																																																													
93	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4">Greenhouse Gas</th> </tr> <tr> <th></th> <th>CO2</th> <th>CH4</th> <th>N2O</th> </tr> </thead> <tbody> <tr> <td>94</td> <td></td> <td></td> <td></td> </tr> <tr> <td>95</td> <td>Emission Factor in lb/MMcf</td> <td>120,000</td> <td>2.3</td> <td style="background-color: #cccccc;">2.2</td> </tr> <tr> <td>96</td> <td></td> <td></td> <td></td> </tr> <tr> <td>97</td> <td></td> <td></td> <td></td> </tr> <tr> <td>98</td> <td>Potential Emission in tons/yr</td> <td>27,311</td> <td>0.52</td> <td>0.50</td> </tr> <tr> <td>99</td> <td></td> <td></td> <td></td> </tr> <tr> <td>100</td> <td></td> <td></td> <td></td> </tr> <tr> <td>101</td> <td>Summed Potential Emissions in tons/yr</td> <td colspan="3" style="text-align: center;">27,312</td> </tr> <tr> <td>102</td> <td></td> <td></td> <td></td> </tr> <tr> <td>103</td> <td></td> <td></td> <td></td> </tr> <tr> <td>104</td> <td>CO2e Total in tons/yr</td> <td colspan="3" style="text-align: center;">27,473</td> </tr> <tr> <td>105</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>																	Greenhouse Gas					CO2	CH4	N2O	94				95	Emission Factor in lb/MMcf	120,000	2.3	2.2	96				97				98	Potential Emission in tons/yr	27,311	0.52	0.50	99				100				101	Summed Potential Emissions in tons/yr	27,312			102				103				104	CO2e Total in tons/yr	27,473			105			
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110	Global Warming Potentials (GWP) from Table A-1 of 40 CFR Part 98 Subpart A.																																																																												
111	Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton																																																																												
112	CO2e (tons/yr) = CO2 Potential Emission ton/yr x CO2 GWP (1) + CH4 Potential Emission ton/yr x CH4 GWP (25) + N2O Potential																																																																												

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	<b>Appendix A: Emissions Calculations</b>																
2	<b>Wet Pad (EU-40)</b>																
3																	
4	<b>Company Name: MGPI of Indiana, LLC</b>																
5	<b>Address: 7 Ridge Avenue, Lawrenceburg, Indiana 47025</b>																
6	<b>Significant Source Modification No.: 0296-35496-00005</b>																
7	<b>Significant Permit Modification No.: 029-35505-00005</b>																
8	<b>Reviewer: Kristen Willoughby</b>																
9	<b>Date: 12/22/2014</b>																
10																	
11	<b>Emission Unit</b>	<b>Emission Point<sup>(a)</sup></b>	<b>Uncontrolled Emission Factors<sup>(b)</sup></b>		<b>0.0083</b>				<b>0.0001</b>		<b>0.00002</b>		<b>0.0002</b>		<b>0.00004</b>		<b>Total Emis</b>
12					<b>lb/ton wet cake</b>				<b>lb/ton wet cake</b>		<b>lb/ton wet cake</b>		<b>lb/ton wet cake</b>		<b>lb/ton wet cake</b>		
13			<b>Dryer Feed<sup>(c)</sup></b>		<b>VOC<sup>(d)</sup></b>				<b>Acetaldehyde<sup>(d)</sup></b>		<b>Acrolein<sup>(d)</sup></b>		<b>Formaldehyde<sup>(d)</sup></b>		<b>Methanol<sup>(d)</sup></b>		
14			<b>(ton/hr)</b>	<b>(ton/yr)</b>	<b>(lb/hr)</b>	<b>(ton/yr)</b>			<b>(lb/hr)</b>	<b>(ton/yr)</b>	<b>(lb/hr)</b>	<b>(ton/yr)</b>	<b>(lb/hr)</b>	<b>(ton/yr)</b>	<b>(lb/hr)</b>	<b>(ton/yr)</b>	
15	EU-40	Wet Cake Production, Storage, and Loadout	24.56	215,154	0.20	0.89			0.002	0.0108	0.0005	0.0022	0.005	0.022	0.001	0.0043	0.012
16																	
17	Notes:																
18	(a) VOC and HAP emissions can result during periods of dryer start-up and shutdown, when the dryer throughput may be diverted to a wet pad so that wet feed is not sent to dry storage.																
19	(b) Emission factor for wet cake taken from a similar operation permitted in Indiana under Permit #T095-30443-00127 (POET Biorefining - Alexandria).																
20	(c) Hourly dryer feed is maximum as taken from the material balance provided by ICM dated 1/30/2015.																
21	(d) Methodology and Sample Calculations:																
22	Emission rate (lb/hr) = Dryer Feed (ton/hr) X Wet Cake Emission factor (lb/ton)																
23	Emission rate (ton/yr) = Dryer Feed (ton/yr) X Wet Cake Emission factor (lb/ton) x ton/2,000 lb																

	R
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8	
9	
10	
11	<b>HAP sions (ton/yr)</b>
12	
13	
14	
15	0.0387
16	
17	
18	
19	
20	
21	
22	
23	

	A	B	C
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6			<b>Signi Sign</b>
7			
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9			
10			
11	<b>EU-41 through EU-43, EU-45, EU-61 Tanks and Bottling Operations</b>		
12		<b>Source</b>	
13		EU-41 (Wine Room)	
14		EU-42 (Tank Farm)	
15		EU-43 (Bldg 88)	
16		EU-45 (Mini Tank Farm)	
17		EU-61 (Whiskey System)	
18		EU-61 (Gin System)	
19		<b>Total</b>	
20			
21	<b>Methodology:</b>		
22		From Permit No. 24407: Emission Factors based on source estimates. No AP-42 or FIRE emission factors are available	
23		Emissions (ton/yr) = Maximum usage (pg/yr)/1,000 x EF (lb/1,000 gal) / 2,000 lb/ton	
24		Emissions (lb/hr) = Emissions (ton/yr) x 2,000 lb/ton / 8,760 hr/yr	
25			
26	<b>EU-71 through EU-76 Warehouse Emissions</b>		
27		<b>Source</b>	
28		EU-71 through EU-76	
29			
30	<b>Methodology:</b>		
31		Emission factor taken from AP-42 Table 9.12.3-1	
32		Emissions (ton/yr) = # barrels x EF (lb/barrel/yr) / 2,000 lb/ton	

	D	E	F	G
1	<b>Appendix A: Emissions Calculations</b>			
2	<b>Summary of Emissions</b>			
3				
4	Company Name: MGPI of Indiana, LLC			
5	Address: 7 Ridge Avenue, Lawrenceburg, Indiana 47025			
6	Significant Source Modification No.: 0296-35496-00005			
7	Significant Permit Modification No.: 029-35505-00005			
8	Reviewer: Kristen Willoughby			
9	Date: 12/22/2014			
10				
11				
12	<b>Maximum Usage (PG/yr)</b>	<b>VOC Emission Factor (lb/1000 gal)</b>	<b>VOC Emissions (lb/hr)</b>	<b>VOC Emissions (ton/yr)</b>
13	32,000,000	1.22	4.46	19.5
14	30,000,000	1.27	4.34	19.0
15	14,000,000	0.67	1.07	4.69
16	10,000,000	0.718	0.82	3.59
17	13,000,000	0.95	1.41	6.18
18	12,775,000	0.913	1.33	5.83
19			<b>13.43</b>	<b>58.8</b>
20				
21				
22				
23				
24				
25				
26				
27	<b>Emission Factor (lb/barrel/yr)</b>	<b># Barrels</b>	<b>VOC Emissions (lb/yr)</b>	<b>VOC Emissions (ton/yr)</b>
28	6.9	541278	3,734,818	1,867
29				
30				
31				
32				

	A	B	C	D	E	F	G	H
1	<b>Appendix A: Emissions Calculations</b>							
2	<b>Rail Car and Truck Loading Emissions.</b>							
3								
4	<b>Company Name: MGPI of Indiana, LLC</b>							
5	<b>Address: 7 Ridge Avenue, Lawrenceburg, Indiana 47025</b>							
6	<b>Significant Source Modification No.: 0296-35496-00005</b>							
7	<b>Significant Permit Modification No.: 029-35505-00005</b>							
8	<b>Reviewer: Kristen Willoughby</b>							
9	<b>Date: 12/22/2014</b>							
10								
11	<b>EU-46 Rail Car and Truck Loading Emissions</b>							
12	Loading Properties <sup>(a)</sup>						Throughput <sup>(b)</sup>	
13	Emission Point	Loading Temperature (F)	Loading Temperature (R)	Vapor Pressure (psi)		Vapor Molecular Weight (lb/lb-mol)	Annual (1,000 gal/yr)	
14	Rail Car and Truck Loading	62	521.67	0.689		46	29,450	
15								
16	Emission Point		Saturation Factor <sup>(c)</sup>	Loading Loss <sup>(d)</sup> (lb/10 <sup>3</sup> gal)	Uncontrolled VOC Emissions <sup>(e)</sup>			
17					Annual (ton/yr)			
18								
19	Rail Car and Truck Loading		0.6	0.454	6.69			
20	Total				6.69			
21								
22	<b>Methodology:</b>							
23	(a) Vapor pressure and molecular weight taken from the material property information for ethanol.							
24	Antoine's Coefficients for ethanol: $\log P = A - [B/(T+C)]$ ; P in bar, T in K							
25	A = 5.37229							
26	B = 1670.409							
27	C = -40.191							
28	T = 289.667 K							
29	P = 0.047 bar							
30	P = 0.689 psi							
31	(b) Maximum annual production of: 31,000,000 gal/yr							
32	Product proof: 190 proof							
33	Product Ethanol concentration: 95%							
34	Maximum annual Ethanol throughput: 29,450,000 gal/yr							
35	(c) Saturation factor for submerged, dedicated loading taken from Section 5.2 of AP-42, Fifth Edition, Volume 1.							
36	(d) Loading loss estimate calculated according to the methodology in Section 5.2 of AP-42, Fifth Edition, Volume 1.							
37	Sample Calculation, average loading loss:							
38	$L_L$ (lb/10 <sup>3</sup> gal) = 12.46 SMP / T ; S = Saturation Factor (-)							
39	M = Vapor Molecular Weight (lb/lb-mol)							
40	P = Vapor Pressure (psi)							
41	T = Loading Temperature (R)							
42								
43	$L_L = \frac{(12.46) (0.6) (46 \text{ lb/lb-mol}) (0.689 \text{ psi})}{521.67 \text{ R}} = 0.454 \text{ lb} / 10^3 \text{ gal}$							
44								
45								
46	(e) Emissions estimated by applying the loading loss to the applicable loading throughput.							
47	sample calculation, annual emissions:							

	A	B	C	D	E	F	G	H
48			0.454 lb	29,450 x1,000 gal	ton	=	6.69	ton
49			1000 gal	yr	2,000 lb			yr
50								
51								
52								
53								
54								
55								
56								
57								
58								
59								

  

HAP	Product	HAP Fraction	Uncontrolled PTE HAP (ton/yr)
Acetaldehyde <sup>1</sup>	ethanol	1.00E-03	6.69E-03
Methanol <sup>2</sup>	ethanol	5.00E-03	3.34E-02
Formaldehyde <sup>1</sup>	ethanol	1.00E-03	6.69E-03
<b>Total</b>			<b>4.68E-02</b>

1. Acetaldehyde and Formaldehyde are estimated to be at trace levels in ethanol. It will conservatively assume that these trace levels do not exceed 1000 ppm in the ethanol product.

2. Methanol concentration is based on maximum weight percent of 0.5% as per ASTM D 4806

Note: HAP emission rates based on performance tests at similar facilities.

	A	B	C	D	E	F	G	
1	<b>Appendix A: Emissions Calculations</b>							
2	<b>Equipment Leak Fugitive Emissions</b>							
3								
4	<b>Company Name: MGPI of Indiana, LLC</b>							
5	<b>Address: 7 Ridge Avenue, Lawrenceburg, Indiana</b>							
6	<b>Significant Source Modification No.: 0296-35496-00005</b>							
7	<b>Significant Permit Modification No.: 029-35505-00005</b>							
8	<b>Reviewer: Kristen Willoughby</b>							
9	<b>Date: 12/22/2014</b>							
10								
11	<b>EU-81 Equipment Leak Fugitive Emissions</b>							
12					<b>VOC</b>		<b>VOC</b>	
13	<b>Component</b>		<b>Count</b>		<b>Emission Factor (lb/hr/component)</b>		<b>% VOC</b>	
14							<b>Emissions (lb/hr)</b>	
15							<b>Emissions (ton/yr)</b>	
16	Pumps		124		0.0439		60%	
17	Valves		4,481		0.0089		60%	
18	Flanges		6,940		0.0005		60%	
19					<b>Total</b>		<b>29.28</b>	
20							<b>128.23</b>	
21	<b>Methodology:</b>							
22	Component counts based on facility estimates. Counts exclude components within former							
23	bottling operation that are no longer owned or operated by MGPI of Indiana, LLC.							
24	Average SOCOMI emission factor, taken from "Protocol for Equipment Leak Emission Estimates",							
25	EPA-453/R-95-017, November 1995							
26	Emissions (lb/hr) = # components x EF (lb/hr/component) x % VOC							
27	Emissions (ton/yr) = Emissions (lb/hr) x 8,760 hr/yr / 2,000 lb/ton							
28	<b>Total Fugitive VOCs (ton/yr) <span style="float: right;">128.23</span></b>							
29	<b>HAP</b>		<b>HAP Fraction</b>		<b>Fugitive HAP Emissions (tons/yr)</b>			
30	Acetaldehyde <sup>1</sup>		1.00E-03		1.28E-01			
31	Methanol <sup>2</sup>		5.00E-03		6.41E-01			
32	Formaldehyde <sup>1</sup>		1.00E-03		1.28E-01			
33	<b>Total</b>				<b>0.90</b>			
	1. Acetaldehyde and Formaldehyde are estimated to be at trace levels in ethanol. It is conservatively assume that these trace levels do not exceed 1000 ppm in the ethanol product.							
	2. Methanol concentration is based on maximum weight percent of 0.5% as per ASTM D 4806							

	A	B	C	D	E	F	G
34	Fugitive HAP Emissions (tons/yr) = VOC (tons/yr) x HAP Fraction						

	A	B	C	D	E	F	G	H	I	J
1	<b>Appendix A: Emission Calculations</b>									
2	<b>Natural Gas Combustion Only</b>									
3	<b>Utility Boiler</b>									
4	<b>Company Name: MGPI of Indiana, LLC</b>									
5	<b>Address: 7 Ridge Avenue, Lawrenceburg, Indiana 47025</b>									
6	<b>Significant Source Modification No.: 0296-35496-00005</b>									
7	<b>Significant Permit Modification No.: 029-35505-00005</b>									
8	<b>Reviewer: Kristen Willoughby</b>									
9	<b>Date: 12/22/2014</b>									
10										
11	Heat Input Capacity	Potential Throughput								
12	MMBtu/hr	MMCF/yr								
13										
14	244.0	2095.5								
15										
16	Pollutant									
17		PM*	PM10*	direct PM2.5*	SO2	NOx	VOC	CO		
18	Emission Factor in lb/MMBtu	1.9	7.6	7.6	0.6	280.0	5.5	84.0		
19						**see below				
20										
21	Potential Emission in tons/yr	1.99	7.96	7.96	0.63	293.4	5.76	88.0		
22										
23	*PM emission factor is filterable PM only. PM10 emission factor is condensable and filterable PM10 combined.									
24	PM2.5 emission factor is condensable and filterable PM2.5 combined.									
25	**Emission Factors for NOx: Uncontrolled = 280 (pre-NSPS) or 190 (post-NSPS), Low NOx Burner = 140, Flue gas recirculation = 100 (See Table 1.4-1)									
26										
27	<b>Methodology</b>									
28	All emission factors are based on norma									
29	MMBtu = 1,020,000									
30	MMCF = 1,000,000 Cf									
31	Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,020 MMBtu									
32	Emission Factors from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2, and 1.4-3, SCC #1-01-006-01, 1-01-006-04									
33	(AP-42 Supplement D									
34	Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton									
35										
36	HAPs - Organics									
37		Benzene	Dichlorobenzene	Formaldehyde	Hexane	Toluene				
38	Emission Factor in lb/MMBtu	2.1E-03	1.2E-03	7.5E-02	1.8E+00	3.4E-03				
39										
40										
41	Potential Emission in tons/yr	2.20E-03	1.26E-03	7.86E-02	1.89E+00	3.56E-03				
42										
43										
44	HAPs - Metals									
45		Lead	Cadmium	Chromium	Manganese	Nickel	Total HAPs			
46	Emission Factor in lb/MMBtu	5.0E-04	1.1E-03	1.4E-03	3.8E-04	2.1E-03				
47										
48										
49	Potential Emission in tons/yr	5.24E-04	1.15E-03	1.47E-03	3.98E-04	2.20E-03	1.98			
50										
51										
52	The five highest organic and metal HAPs emission factors are provided above.									
53	Additional HAPs emission factors are available in AP-42, Chapter 1.4.									
54										
55	Greenhouse Gas									

	A	B	C	D	E	F	G	H	I	J
56				CO2	CH4	N2O				
57	Emission Factor in lb/MMCF			120,000	2.3	2.2				
58										
59										
60	Potential Emission in tons/yr			125,732	2.4	2.3				
61										
62										
63	Summed Potential Emissions in tons/yr				125,736					
64										
65										
66	CO2e Total in tons/yr				126,479					
67										
68										
69	<b>Methodology</b>									
70	The N2O Emission Factor for uncontrolled is 2.2. The N2O Emission Factor for low NOx burner is 0.64.									
71	Emission Factors are from AP 42, Table 1.4-2 SCC #1-02-006-02, 1-01-006-02, 1-03-006-02, and 1-03-006-03.									
72	Global Warming Potentials (GWP) from Table A-1 of 40 CFR Part 98 Subpart A.									
73	Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton									
74	CO2e (tons/yr) = CO2 Potential Emission ton/yr x CO2 GWP (1) + CH4 Potential Emission ton/yr x CH4 GWP (25) + N2O Potential Emission ton/yr x N2O GWP (298).									

	A	B	C	D	E	F	G	H	I	J
1	<b>Appendix A: Emission Calculations</b>									
2	<b>Natural Gas Combustion Only</b>									
3	<b>Utility Boiler</b>									
4	<b>Company Name: MGPI of Indiana, LLC</b>									
5	<b>Address: 7 Ridge Avenue, Lawrenceburg, Indiana 47025</b>									
6	<b>Significant Source Modification No.: 0296-35496-00005</b>									
7	<b>Significant Permit Modification No.: 029-35505-00005</b>									
8	<b>Reviewer: Kristen Willoughby</b>									
9	<b>Date: 12/22/2014</b>									
10										
11	Heat Input Capacity	HHV	Potential Throughput							
12	MMBtu/hr	MMBtu	MMCF/yr							
13		MMcf								
14	47.6	1020	408.8							
15										
16										
17	Unrecognized Fuel Oil usage	HHV	Potential Throughput							
18	Heat Input Capacity	MMBtu	MMCF/yr							
19	MMBtu/yr	MMcf								
20	140736.0	1020	138.0							
21										
22										
23	Pollutant									
24		PM*	PM10*	direct PM2.5*	SO2	NOx	VOC	CO		
25	Emission Factor in lb/MMCF	1.9	7.6	7.6	0.6	100	5.5	84		
26						**see below				
27	Potential Emission in	0.39	1.55	1.55	0.12	20.4	1.12	17.2		
28										
29	Potential Emissions from Unr	0.13	0.52	0.52	0.04	6.90	0.38	5.80		
30										
31	Fuel Oil consumption									
32	*PM emission factor is filterable PM only. PM10 emission factor is filterable and condensable PM10 combined.									
33	PM2.5 emission factor is filterable and condensable PM2.5 combined.									
34	**Emission Factors for NOx: Uncontrolled = 100, Low NOx Burner = 50, Low NOx Burners/Flue gas recirculation = 32									
35										
36	<b>Methodology</b>									
37	All emission factors are based on normal firir									
38	MMBtu = 1,000,000 Btu									
39	MMCF = 1,000,000 Cubic Feet									
40	Emission Factors are from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2, 1.4-3, SCC #1-02-006-02, 1-01-006-02, 1-03-006-02, and 1-03-006-03									
41	Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,020 MMBtu									
42	Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton									
43										
44	<b>HAPS Calculations</b>									
45										
46	HAPs - Organics									
47		Benzene	Dichlorobenzene	Formaldehyde	Hexane	Toluene	Total - Organics			
48	Emission Factor in lb/MMCF	2.1E-03	1.2E-03	7.5E-02	1.8E+00	3.4E-03				
49										
50	Potential Emission in	4.292E-04	2.453E-04	1.533E-02	3.679E-01	6.950E-04	3.846E-01			
51										
52										
53										
54	HAPs - Metals									
55		Lead	Cadmium	Chromium	Manganese	Nickel	Total - Metals			
56	Emission Factor in lb/MMCF	5.0E-04	1.1E-03	1.4E-03	3.8E-04	2.1E-03				

	A	B	C	D	E	F	G	H	I	J
57										
58										
59	Potential Emission in			1.022E-04	2.248E-04	2.862E-04	7.767E-05	4.292E-04	1.120E-03	
60										
61								<b>Total HAPs</b>	<b>3.857E-01</b>	
62	Methodology is the same as :							<b>Worst HAP</b>	<b>3.679E-01</b>	
63										
64	The five highest organic and metal HAPs emission factors are provided above.									
65	Additional HAPs emission factors are available in AP-42, Chapter 1.4.									
66										
67	<b>Greenhouse Gas Calculations</b>									
68										
69				Greenhouse Gas						
70				CO2	CH4	N2O				
71	Emission Factor in lb			120,000	2.3	2.2				
72										
73										
74	Potential Emission in			24,528	0.5	0.4				
75										
76										
77	Summed Potential Emissions in tons/yr			24,529						
78										
79										
80	CO2e Total in tons/yr			24,674						
81										
82										
83	<b>Methodology</b>									
84	The N2O Emission Factor for uncontrolled is 2.2. The N2O Emission Factor for low NOx burner is 0.64.									
85	Emission Factors are from AP 42, Table 1.4-2 SCC #1-02-006-02, 1-01-006-02, 1-03-006-02, and 1-03-006-03.									
86	Global Warming Potentials (GWP) from Table A-1 of 40 CFR Part 98 Subpart A.									
87	Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton									
88	CO2e (tons/yr) = CO2 Potential Emission ton/yr x CO2 GWP (1) + CH4 Potential Emission ton/yr x CH4 GWP (25) + N2O Potential Emission ton/yr x									

	A	B	C	D	E	F	G	H	I	J
1	<b>Appendix A: Emissions Calculations</b>									
2	<b>Commercial/Institutional/Residential Combustors (&lt; 100 MMBtu/hr)</b>									
3	<b>#1 and #2 Fuel Oil</b>									
4	Company Name: MGPI of Indiana, LLC									
5	Address: 7 Ridge Avenue, Lawrenceburg, Indiana 47025									
6	Significant Source Modification No.: 0296-35496-00005									
7	Significant Permit Modification No.: 029-35505-00005									
8	Reviewer: Kristen Willoughby									
9	Date: 12/22/2014									
10										
11	Heat Input Capacity Potential Throughput			Limited Throughput						S = Weight Factor
12	MMBtu/hr		kgals/year	kgals/yr						0.3
13										
14	45.6		2853.3		1848					
15										
16	Unrecognized Fuel Oil usage			Unrecognized Heat Input Capacity						
17	(kgals/year)			MMBtu/yr						
18	1005.3			140736.0						
19										
20										
21										
22	<b>Pollutant</b>									
23				PM*	PM10	direct PM2.5	SO2	NOx	VOC	CO
24	Emission Factor			2.0	2.3	1.55	42.6	20.0	0.20	5.0
25							(142.0S)			
26	Limited Emission Factor in lb/kgal						43.00			
27										
28	Potential Emission in tons/yr			2.85	3.28	2.21	60.8	28.5	0.29	7.1
29	Limited Emissions from fuel oil in tons/yr			1.85	2.13	1.43	39.7	18.5	0.185	4.62
30										
31	<b>Methodology</b>									
32	1 gallon of No. 2 Fuel Oil has a heating value of 140,000 Btu									
33	Potential Throughput (kgals/year) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1kgal per 1000 gallon x 1 gal per 0.140 MM Btu									
34	Emission Factors are from AP 42, Tables 1.3-1, 1.3-2, 1.3-3 and 1.3-6 (SCC 1-02-005-01/02/03) Supplement E 9/98 (see erata file)									
35	*PM emission factor is filterable PM only. Condensable PM emission factor is 1.3 lb/kgal.									
36	Emission (tons/yr) = Throughput (kgals/ yr) x Emission Factor (lb/kgal)/2,000 lb/ton									
37										
38	<b>HAPs - Metals</b>									
39				Arsenic	Beryllium	Cadmium	Chromium	Lead		
40	Emission Factor in lb/MMBtu			4.0E-06	3.0E-06	3.0E-06	3.0E-06	9.0E-06		
41										
42	Potential Emission in tons/yr			7.99E-04	5.99E-04	5.99E-04	5.99E-04	1.80E-03		
43										
44										
45										
46	<b>HAPs - Metals (continued)</b>									
47				Mercury	Manganese	Nickel	Selenium			
48	Emission Factor in lb/MMBtu			3.0E-06	6.0E-06	3.0E-06	1.5E-05			
49										
50	Potential Emission in tons/yr			5.99E-04	1.20E-03	5.99E-04	3.00E-03			Total 9.8E-03
51										
52										
53										
54	<b>Methodology</b>									
55	No data was available in AP-42 for organic HAPs.									
56	Potential Emissions (tons/year) = Throughput (MMBtu/hr)*Emission Factor (lb/MMBtu)*8,760 hrs/yr / 2,000 lb/ton									
57										
58	<b>Greenhouse Gas</b>									
59				CO2	CH4	N2O				
60	Emission Factor			22,300	0.052	0.26				
61										
62	Potential Emission in tons/yr			31,814	0.1	0.4				
63										
64										
65	Summed Potential Emissions in tons/yr				31,814					
66										
67										
68	CO2e Total in tons/yr				31,926					
69										
70										
71										
72	<b>Methodology</b>									
73	The CO2 Emission Factor for #1 Fuel Oil is 21500. The CO2 Emission Factor for #2 Fuel Oil is 22300.									
74	Emission Factors are from AP 42, Tables 1.3-3, 1.3-8, and 1.3-12 (SCC 1-02-005-01/02/03) Supplement E 9/99 (see erata file)									
75	Global Warming Potentials (GWP) from Table A-1 of 40 CFR Part 98 Subpart A.									
76	Emission (tons/yr) = Throughput (kgals/ yr) x Emission Factor (lb/kgal)/2,000 lb/ton									
77	CO2e (tons/yr) = CO2 Potential Emission ton/yr x CO2 GWP (1) + CH4 Potential Emission ton/yr x CH4 GWP (25) + N2O Potential Emission ton/yr x N2O GWP (298).									

	D	E
1	<b>Appendix A: Emission Calculations</b>	
2	<b>Large Reciprocating Internal Combustion Engines - Diesel Fuel</b>	
3	<b>Emergency Generator</b>	
4		
5	<b>Company Name: MGPI of Indiana, LLC</b>	
6	<b>Address: 7 Ridge Avenue, Lawrenceburg, Indiana 47025</b>	
7	<b>Significant Source Modification No.: 0296-35496-00005</b>	
8	<b>Significant Permit Modification No.: 029-35505-00005</b>	
9	<b>Reviewer: Kristen Willoughby</b>	
10	<b>Date: 12/22/2014</b>	

	A	B	C	D	E	F	G
12	<b>B. Emissions calculated based on output rating (hp)</b>						
13							
14			Output Horsepower Rating (hp)	1600.0			
15			Maximum Hours Operated per Year	500			
16			Potential Throughput (hp-hr/yr)	800,000			
17			Sulfur Content (S) of Fuel (% by weight)	0.500			
18							
19						Pollutant	
20			PM*	PM10*	direct PM2.5*	SO2	NOx
21	Emission Factor in lb/hp-hr		7.00E-04	4.01E-04	4.01E-04	4.05E-03	2.40E-02
22						(.00809S)	**see below
23	Potential Emission in tons/yr		0.28	0.16	0.16	1.62	9.60
24	*PM10 emission factor in lb/hp-hr was calculated using the emission factor in lb/MMBtu and a brake specific fuel consumption of 7,000 Btu / hp-hr (AP-42 Table 3.3-1).						
25							
26	**NOx emission factor: uncontrolled = 0.024 lb/hp-hr, controlled by ignition timing retard = 0.013 lb/hp-hr						
27							
28	<b>Hazardous Air Pollutants (HAPs)</b>						
29						Pollutant	
30							
31			Benzene	Toluene	Xylene	Formaldehyde	Acetaldehyde
32	Emission Factor in lb/hp-hr****		5.43E-06	1.97E-06	1.35E-06	5.52E-07	1.76E-07
33	Potential Emission in tons/yr		2.17E-03	7.87E-04	5.40E-04	2.21E-04	7.06E-05
34	***PAH = Polyaromatic Hydrocarbon (PAHs are considered HAPs, since they are considered Polycyclic Organic Matter)						
35	****Emission factors in lb/hp-hr were calculated using emission factors in lb/MMBtu and a brake specific fuel consumption of 7,000 Btu / hp-hr (AP-42 Table 3.3-1).						
36							
37							
38							
39	<b>Green House Gas Emissions (GHG)</b>						
40						Pollutant	
41							
42			CO2	CH4	N2O		
43	Emission Factor in lb/hp-hr		1.15E+00	4.62E-05	9.24E-06		
44	Potential Emission in tons/yr		4.60E+02	1.85E-02	3.70E-03		
45							
46							
47							
48							
49	Emission Factors are from AP 42 (Supplement B 10/96) Tables 3.4-1 , 3.4-2, 3.4-3, and 3.4-4.						
50	CH4 and N2O Emission Factor from 40 CFR 98 Subpart C Table C-2.						
51	Global Warming Potentials (GWP) from Table A-1 of 40 CFR Part 98 Subpart A.						
52	Potential Throughput (hp-hr/yr) = [Output Horsepower Rating (hp)] * [Maximum Hours Operated per Year]						
53	Potential Emission (tons/yr) = [Potential Throughput (hp-hr/yr)] * [Emission Factor (lb/hp-hr)] / [2,000 lb/ton]						
54	CO2e (tons/yr)= CO2 Potential Emission ton/yr x CO2 GWP (1) + CH4 Potential Emission ton/yr x CH4 GWP (25) + N2O Potential Emission ton/yr x N2O GWP (298).						

	H	I
12		
13		
14		
15		
16		
17		
18		
19		
20	VOC	CO
21	7.05E-04	5.50E-03
22		
23	0.28	2.20
24		
25		
26		
27		
28		
29		
30		Total PAH
31	Acrolein	HAPs***
32	5.52E-08	1.48E-06
33	2.21E-05	5.94E-04
34		
35		
36		
37		
38	<b>Potential Emission of Total HAPs (tons/yr)</b>	<b>4.41E-03</b>
39		
40		
41		
42		
43		
44		
45		
46	<b>Summed Potential Emissions in tons/yr</b>	<b>4.60E+02</b>
47	<b>CO2e Total in tons/yr</b>	<b>4.62E+02</b>
48		
49		
50		
51		
52		
53		
54		

	A	B	C	D	E	F	G	H
1	<b>Appendix A: Emission Calculations</b>							
2	<b>Reciprocating Internal Combustion Engines - Natural Gas</b>							
3	<b>2-Stroke Lean-Burn (2SLB) Engines</b>							
4	<b>Company Name: MGPI of Indiana, LLC</b>							
5	<b>Address: 7 Ridge Avenue, Lawrenceburg, Indiana 47025</b>							
6	<b>Significant Source Modification No.: 0296-35496-00005</b>							
7	<b>Significant Permit Modification No.: 029-35505-00005</b>							
8	<b>Reviewer: Kristen Willoughby</b>							
9	<b>Date: 12/22/2014</b>							
10								
11			Maximum Heat Input Capacity (MMBtu/hr)		0.121			
12			Maximum Hours Operated per Year (hr/yr)		500			
13			Potential Fuel Usage (MMBtu/yr)		60.5			
14			High Heat Value (MMBtu/MMscf)		1020			
15			Potential Fuel Usage (MMcf/yr)		0.06			
16								
17					Pollutant			
18	<b>Criteria Pollutants</b>	PM*	PM10*	PM2.5*	SO2	NOx	VOC	CO
19	Emission Factor (lb/MMBtu)	3.84E-02	4.83E-02	4.83E-02	5.88E-04	3.17E+00	1.20E-01	3.86E-01
20	Potential Emissions (tons/yr)	0.001	0.001	0.001	1.78E-05	0.10	0.004	0.01
21	*PM emission factor is for filterable PM-10. PM10 emission factor is filterable PM10 + condensable PM.							
22	PM2.5 emission factor is filterable PM2.5 + condensable PM.							
23								
24	<b>Hazardous Air Pollutants (HAPs)</b>							
25	Pollutant	Emission Factor (lb/MMBtu)	Potential Emissions (tons/yr)					
26	Acetaldehyde	7.76E-03	2.35E-04					
27	Acrolein	7.78E-03	2.35E-04					
28	Benzene	1.94E-03	5.87E-05					
29	1,3-Butadiene	8.20E-04	2.48E-05					
30	Ethylbenzene	1.08E-04	3.27E-06					
31	Formaldehyde	5.52E-02	1.67E-03					
32	Methanol	2.48E-03	7.50E-05					
33	Methylene Chloride	1.47E-04	4.45E-06					
34	Hexane	4.45E-04	1.35E-05					
35	Toluene	9.63E-04	2.91E-05					
36	2,2,4-Trimethylpentane	8.46E-04	2.56E-05					
37	Total PAH**	1.34E-04	4.05E-06					
38		<b>Total</b>	<b>2.38E-03</b>					
39								
40	**PAH = Polyaromatic Hydrocarbon (PAHs are considered HAPs, since they are considered Polycyclic Organic Matter)							
41								
42	<b>Methodology</b>							
43	Emission Factors are from AP-42 (Supplement F, July 2000), Table 3.2-1							
44	Potential Fuel Usage (MMBtu/yr) = [Maximum Heat Input Capacity (MMBtu/hr)] * [Maximum Hours Operating per Year (hr/yr)]							
45	Potential Emissions (tons/yr) = [Potential Fuel Usage (MMBtu/yr)] * [Emission Factor (lb/MMBtu)] / [2000 lb/ton]							
46								
47					Greenhouse Gas (GHG)			
48	<b>Greenhouse Gases (GHGs)</b>		CO2	CH4	N2O			
49	Emission Factor in lb/MMBtu*		110	1.25				
50	Emission Factor in lb/MMcf**				2.2			
51	Potential Emission in tons/yr		3.33	0.04	0.00			
52								
53	Summed Potential Emissions in tons/yr		3.37					
54								

	A	B	C	D	E	F	G	H
55								
56	CO2e Total in tons/y				4.29			
57								
58								
59	<b>Methodology</b>							
60	*The CO2 and CH4 emission factors are from Emission Factors are from AP-42 (Supplement F, July 2000), Table 3.2-2							
61	**The N2O emission factor is from AP 42, Table 1.4-2. The N2O Emission Factor for uncontrolled is 2.2. The N2O Emission Factor for low NOx burner is 0.64.							
62	Global Warming Potentials (GWP) from Table A-1 of 40 CFR Part 98 Subpart A.							
63	For CO2 and CH4: Emission (tons/yr) = [Potential Fuel Usage (MMBtu/yr)] * [Emission Factor (lb/MMBtu)] / [2,000 lb/ton]							
64	For N2O: Emission (tons/yr) = [Potential Fuel Usage (MMCF/yr)] * [Emission Factor (lb/MMCF)] / [2,000 lb/ton]							
65	CO2e (tons/yr) = CO2 Potential Emission ton/yr x CO2 GWP (1) + CH4 Potential Emission ton/yr x CH4 GWP (25) + N2O Potential Emission ton/yr x N2O GWP (298).							
66								
67	<b>Abbreviations</b>							
68	PM = Particulate Matter		NOx = Nitrous Oxides				CO2 = Carbon Dioxide	
69	PM10 = Particulate Matter (<10 um)		VOC - Volatile Organic Compounds				CH4 = Methane	
70	SO2 = Sulfur Dioxide		CO = Carbon Monoxide				N2O = Nitrous Oxide	
71							CO2e = CO2 equivalent emissions	

	A	B	C	D	E	F
1	<b>Appendix A: Emission Calculations</b>					
2	<b>Reciprocating Internal Combustion Engines - Diesel Fuel</b>					
3	<b>Output Rating (&lt;=600 HP)</b>					
4	<b>Maximum Input Rate (&lt;=4.2 MMBtu/hr)</b>					
5	<b>Company Name: MGPI of Indiana, LLC</b>					
6	<b>Address: 7 Ridge Avenue, Lawrenceburg, Indiana 47025</b>					
7	<b>Significant Source Modification No.: 0296-35496-00005</b>					
8	<b>Significant Permit Modification No.: 029-35505-00005</b>					
9	<b>Reviewer: Kristen Willoughby</b>					
10	<b>Date: 12/22/2014</b>					
11						
12	<b>Emissions calculated based on output rating (hp)</b>					
13						
14		Output Horsepower Rating (hp)	235.0			
15		Maximum Hours Operated per Year	500			
16		Potential Throughput (hp-hr/yr)	117,500			
17		Sulfur Content (S) of Fuel (% by weight)	0.500			
18						
19						Pollutant
20		PM*	PM10*	direct PM2.5*	SO2	
21	Emission Factor in lb/hp-hr	2.20E-03	2.20E-03	2.20E-03	2.05E-03	
22						
23	Potential Emission in tons/yr	0.13	0.13	0.13	0.12	
24	*PM10 emission factor in lb/hp-hr was calculated using the emission factor in lb/MMBtu and a brake specific fuel consumption of 7,000 Btu / hp-hr (AP-42 Table 3.3-1).					
25						
26	**NOx emission factor: uncontrolled = 0.024 lb/hp-hr, controlled by ignition timing retard = 0.013 lb/hp-hr					
27						
28	<b>Hazardous Air Pollutants (HAPs)</b>					
29						Pollutant
30		Benzene	Toluene	Xylene	1,3-Butadiene	
31						
32	Emission Factor in lb/hp-hr****	6.53E-06	2.86E-06	2.00E-06	2.74E-07	
33	Potential Emission in tons/yr	3.84E-04	1.68E-04	1.17E-04	1.61E-05	
34	***PAH = Polyaromatic Hydrocarbon (PAHs are considered HAPs, since they are considered Polycyclic Organic Matter)					
35	****Emission factors in lb/hp-hr were calculated using emission factors in lb/MMBtu and a brake specific fuel consumption of 7,000 Btu / hp-hr (AP-42 Table 3.3-1).					
36						
37						
38						
39	<b>Green House Gas Emissions (GHG)</b>					
40						Pollutant
41						
42		CO2	CH4	N2O		
43	Emission Factor in lb/hp-hr	1.15E+00	4.62E-05	9.24E-06		
44	Potential Emission in tons/yr	6.76E+01	2.71E-03	5.43E-04		
45						
46						
47						
48						
49	<b>Methodology</b>					

	A	B	C	D	E	F
50	Emission Factors are from AP42 (Supplement B 10/96), Tables 3.3-1 and 3.3-2					
51	CH4 and N2O Emission Factor from 40 CFR 98 Subpart C Table C-2.					
52	Global Warming Potentials (GWP) from Table A-1 of 40 CFR Part 98 Subpart A.					
53	Potential Throughput (hp-hr/yr) = [Output Horsepower Rating (hp)] * [Maximum Hours Operated per Year]					
54	Potential Emission (tons/yr) = [Potential Throughput (hp-hr/yr)] * [Emission Factor (lb/hp-hr)] / [2,000 lb/ton]					
55	CO2e (tons/yr) = CO2 Potential Emission ton/yr x CO2 GWP (1) + CH4 Potential Emission ton/yr x CH4 GWP (25) + N2O Potential Emission ton/yr x N2O GWP (298).					

	G	H	I	J
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11				
12				
13				
14				
15				
16				
17				
18				
19				
20	NOx	VOC	CO	
21	3.10E-02	2.51E-03	6.68E-03	
22				
23	1.82	0.15	0.39	
24				
25				
26				
27				
28				
29				
30				Total PAH HAPs***
31	Formaldehyde	Acetaldehyde	Acrolein	
32	8.26E-06	5.37E-06	6.48E-07	1.18E-06
33	4.85E-04	3.15E-04	3.80E-05	6.91E-05
34				
35				
36				
37				
38	<b>Potential Emission of Total HAPs (tons/yr)</b>		<b>1.59E-03</b>	
39				
40				
41				
42				
43				
44				
45				
46	<b>Summed Potential Emissions in tons/yr</b>		<b>6.76E+01</b>	
47	<b>CO2e Total in tons/yr</b>		<b>6.78E+01</b>	
48				
49				

	G	H	I	J
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55				